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## Adobe After Effects 4.1 for Macintosh and Windows: Visual QuickPro Guide

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**Importing Footage into a Project > Importing Motion Footage**

### Importing Motion Footage

Motion footage sources include video digitized from analog video sources (such as Hi8 or BetaCamSP), digital video (such as DV transferred via Firewire, or Digital Betacam via SDI), and film (scanned as Cineon files, or transferred to video using 3:2 pulldown).

The process of importing motion footage varies little from other types of files. But as you have already learned, different formats must be interpreted by After Effects according to their attributes and your requirements. In the following sections, you'll learn about the Interpret Footage command that is used to correctly identify motion footage's frame rate, field order, 3:2 pulldown, and the pixel aspect ratio. The Interpret footage command also enables you to automatically loop footage, and set the display quality of EPS footage files. You can even learn to edit After Effects' internal settings.

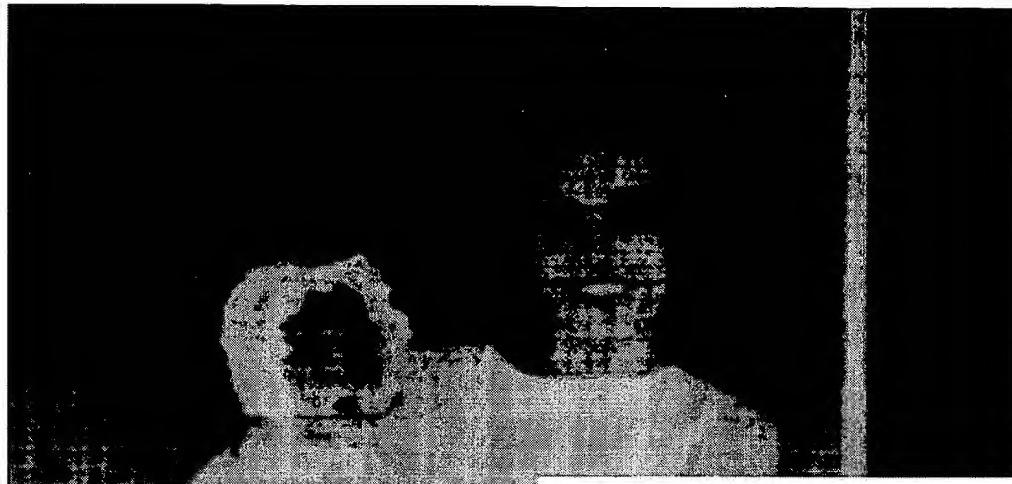
### Interlaced Video and Field Order

Video designed exclusively for computer monitors uses a progressive scan; full-frame, full-motion video for television is interlaced.

In a *progressive scan*, the horizontal lines of each frame are displayed (progressively) from the top of the frame to the bottom, in a single pass (Figure 2.65).

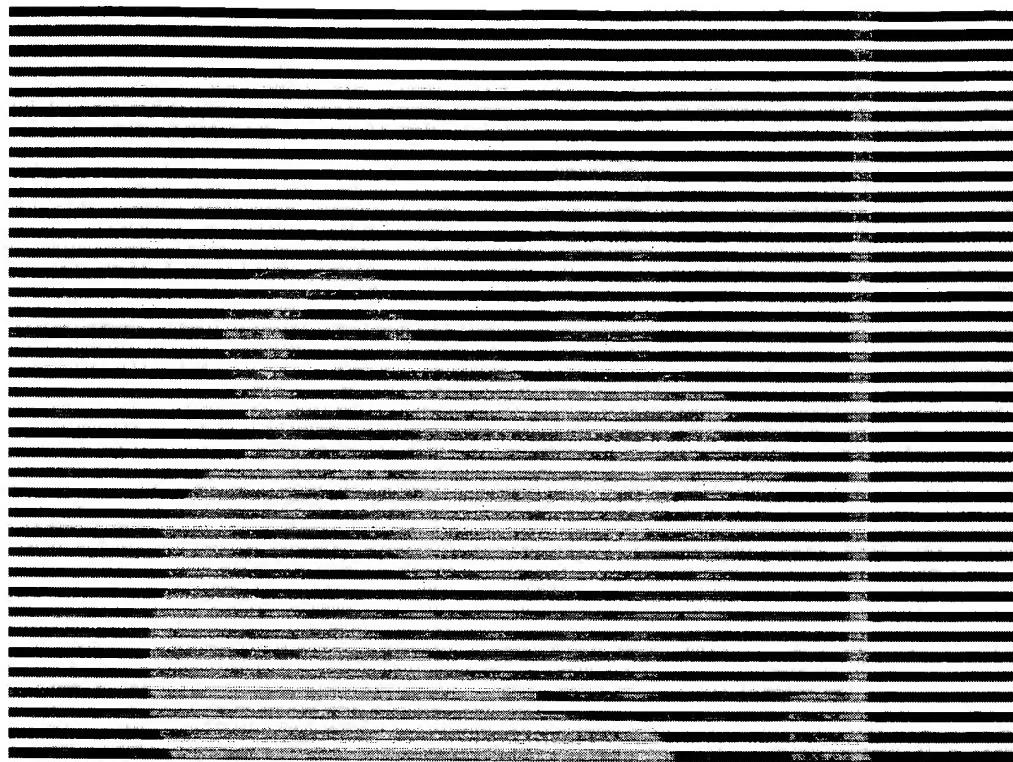
**Figure 2.65. In a progressive scan, the complete image is drawn in a single pass.**

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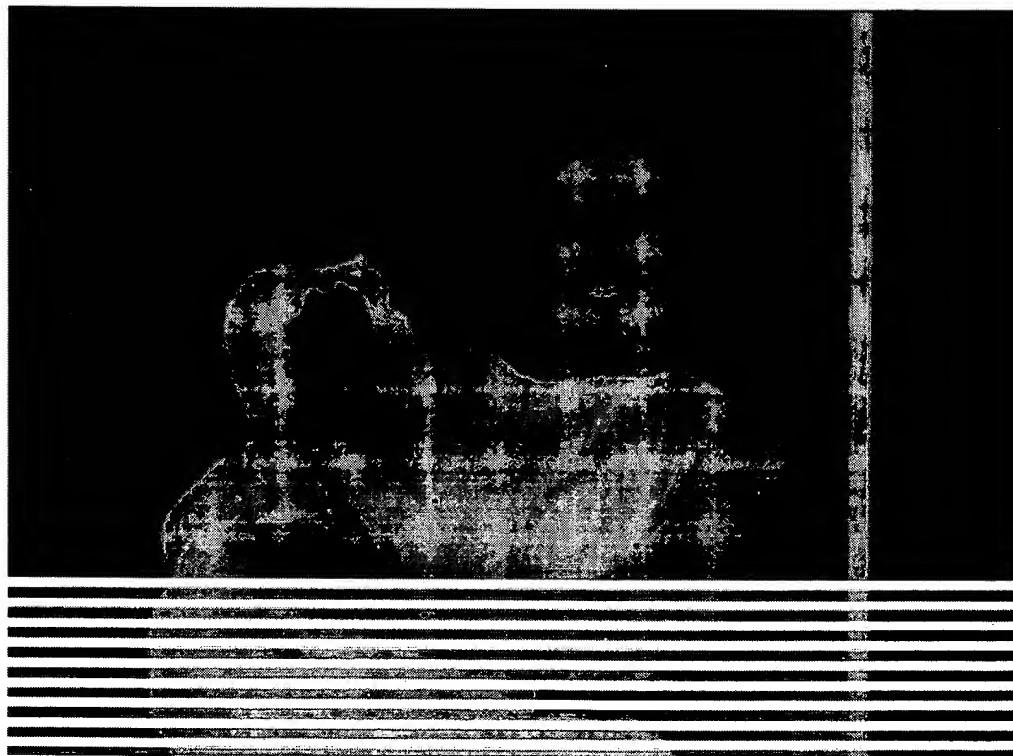


*Interlaced* video divides each frame of video into two fields. Each field includes every other horizontal line (scan line) in the frame. One field is displayed first, drawn as alternating lines from the top of the image to the bottom (Figure 2.66). Starting from the top again, the alternate field is displayed, filling in the gaps to complete the frame (Figure 2.67).

**Figure 2.66. Interlaced video presents a single field that includes every other line of the image...**



**Figure 2.67.** then interlaces the opposite field to create the full frame.



The field that contains the topmost scan line is called *field 1*, the **odd** field, or the *upper* field. The other field

is known as *field 2*, the *even field*, or the *lower field*. Your video equipment and the settings you choose determine which field is the dominant field—the field displayed first.

When you import interlaced video, After Effects must correctly interpret the field order to play back the video accurately. If the fields are presented in the wrong order, movement appears staggered.

**To interpret fields in video footage:**

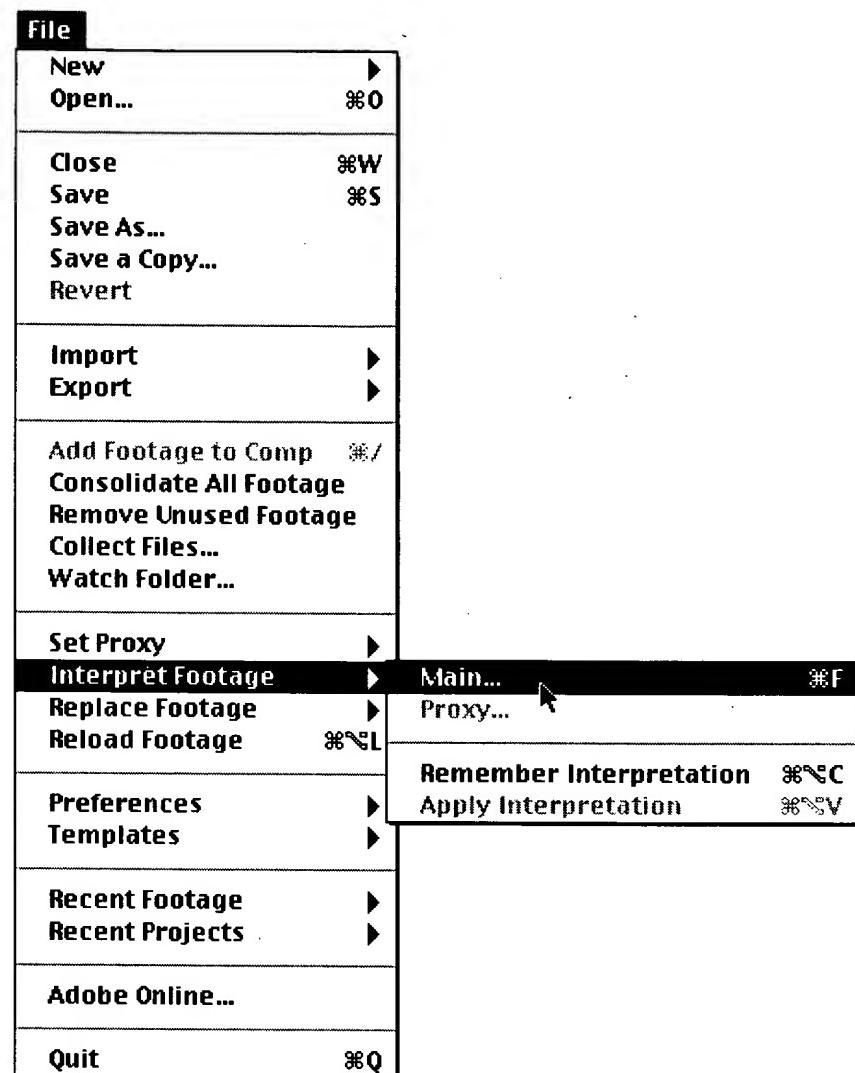
1. In the Project window, select an interlaced video or field-rendered footage item (Figure 2.68).

**Figure 2.68. Select a footage item that uses interlaced video fields.**



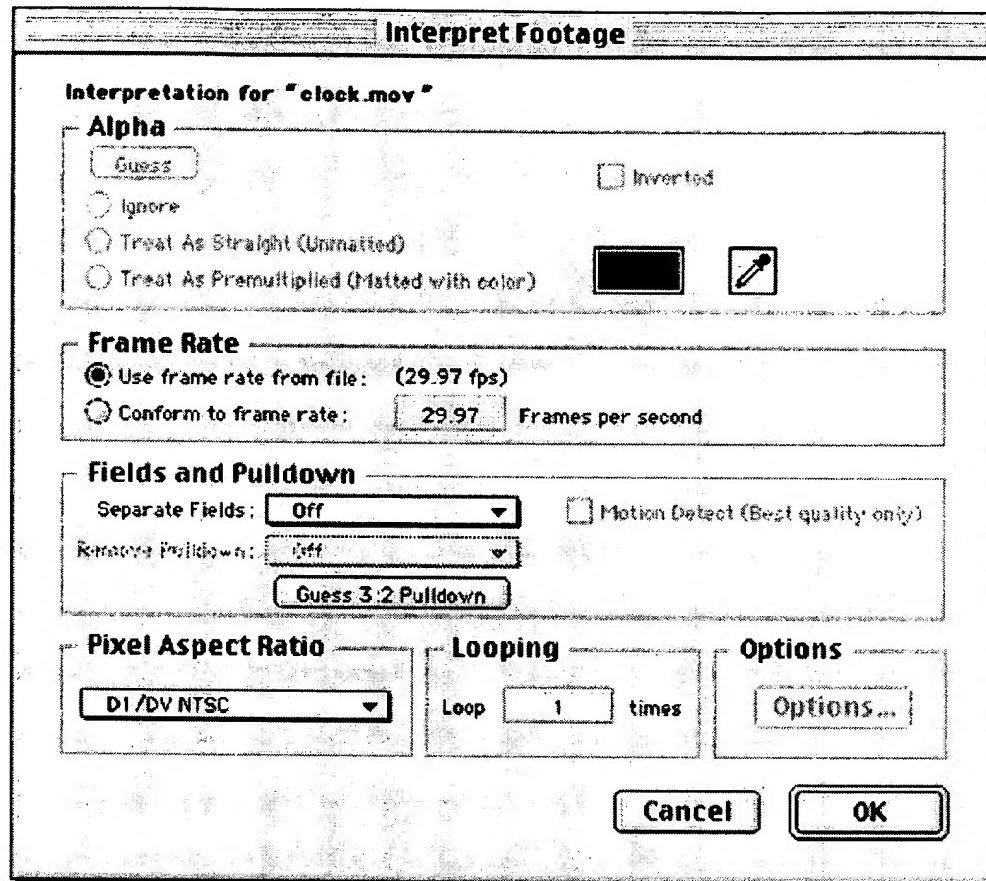
2. Choose File > Interpret Footage > Main (Figure 2.69).

**Figure 2.69. Choose File > Interpret Footage > Main.**



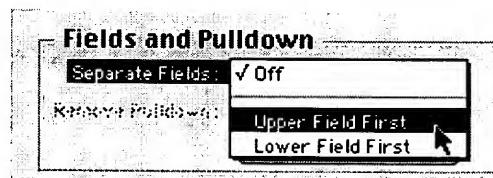
The Interpret Footage dialog box opens (Figure 2.70).

**Figure 2.70. The Interpret Footage dialog box opens.**



3. In the Fields and Pulldown section of the Interpret Footage dialog box, select an option from the Separate Fields pull-down menu (Figure 2.71):

**Figure 2.71. Choose the correct field dominance from the pull-down menu.**



**Off**— Does not separate fields. Use this option for footage that does not contain interlaced video fields.

**Upper Field First**— Correctly separates the fields of upper-field dominant source files. Upper field is also called field 1, or the **odd** field.

**Lower Field First**— Correctly separates the fields of lower-field dominant source files. Lower field is also called field 2, or the **even** field.

4. Click OK to close the Interpret Footage dialog box.

**Tip**

Some programs label a file with the field order when they render. Starting in version 4.1, After Effects recognizes the label and automatically applies the appropriate field order interpretation. You can still override the interpretation by using the Interpretation Rules file, as explained later in this chapter.

**Tip**

If your final output is destined for computer display only (not video display), or at less than full screen size, deinterlace the video before you import it. This spares you from separating fields in After Effects or processing unnecessary information.

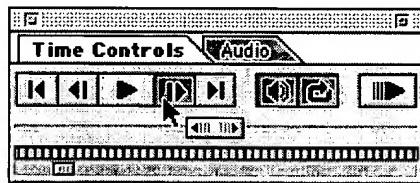
**To determine field order manually:**

1. In the Project window, select an interlaced video or field-rendered footage item.
  2. Choose File > Interpret Footage > Main.
- The Interpret Footage dialog box appears.
3. In the Fields and Pulldown section of the Interpret Footage dialog box, select Upper Field First.
  4. Click OK to close the Interpret Footage dialog box.
  5. In the Project window, Option-double-click (Mac) or Alt-double-click (Windows) the footage item.

The footage item opens in a Footage window. The resolution appears lower, because only one field is visible, which is doubled to complete the frame. However, this allows you to examine one field at a time and determine the field order.

6. In the Time Controls window, use the frame advance button  or press Page Down on the keyboard to play the footage one field at a time (Figure 2.72).

**Figure 2.72. Pressing the frame advance button actually steps through one field (albeit doubled) at a time. You may also press Page Down on your keyboard.**



**Table 2.1. Field Order Cheat Sheet**

Device	Field Dominance
AVID MCXpress Mac	Upper
AVID MCXpress 2.5 & later Windows NT	Lower

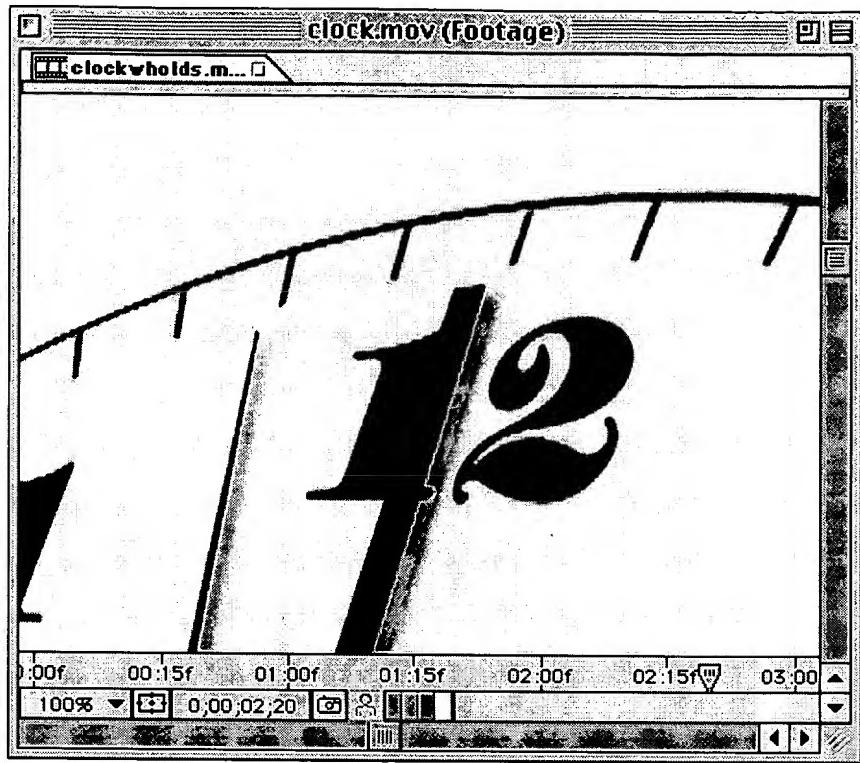
AVID MCXpress 2.2 & earlier Windows NT	Upper
AVID Media Composer, Symphony	Lower
AVID Media Composer 6.x & 7.x Windows NT	Upper
AVID Media Composer 8.x Windows NT	Lower
AVID all PAL systems	Upper
DDR (various manufacturers)	Lower
Discreet Logic Edit*	Lower
DV (miniDV,DVCam,DVCpro)	Lower
Media 100	Upper
Media 100 Finish	Lower
Radius Video Vision	Upper
Scitex Sphere	Lower
Truevision Targa (all cards)	Lower

7. Examine moving objects in the image as you step through the footage. After advancing the footage at least five fields or more, make one of the following determinations:

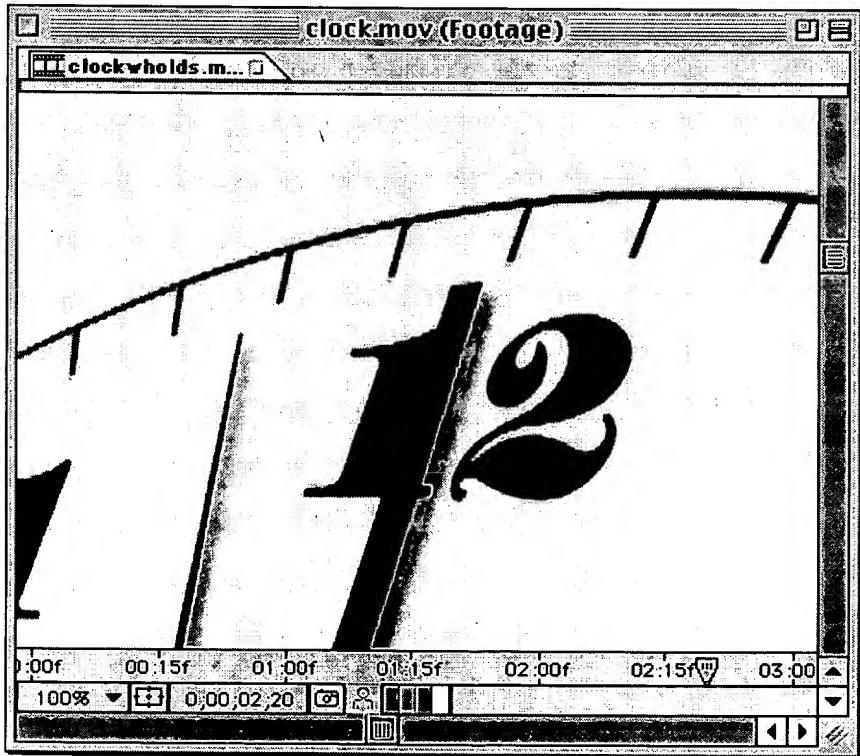
If the objects consistently move in one direction, then the field dominance is interpreted correctly.

If the objects seem to stutter backward, then the field dominance is interpreted incorrectly (Figure 2.73, Figure 2.74, and Figure 2.75). You should interpret the footage using the opposite field dominance setting in the Interpret Footage command.

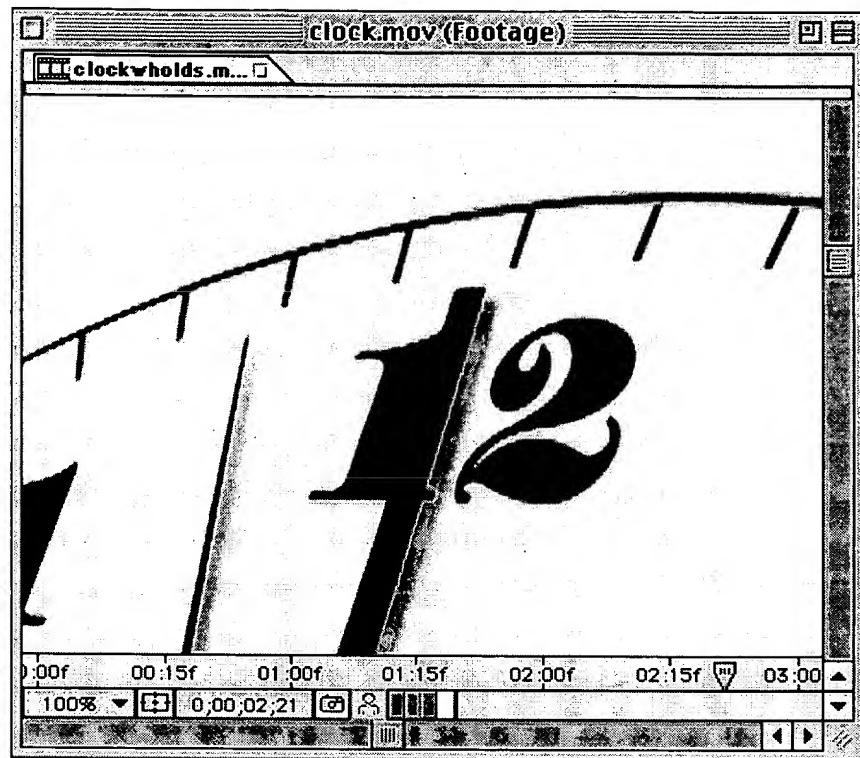
**Figure 2.73. As you step through each field of video, check to see that motion continues consistently forward. The second hand should progress consistently forward...**



**Figure 2.74. yet it moves back in the next field...**



**Figure 2.75.** then forward in the next. This means the fields are presented out of order.



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### Importing Footage into a Project > Importing Files with Alpha Channels

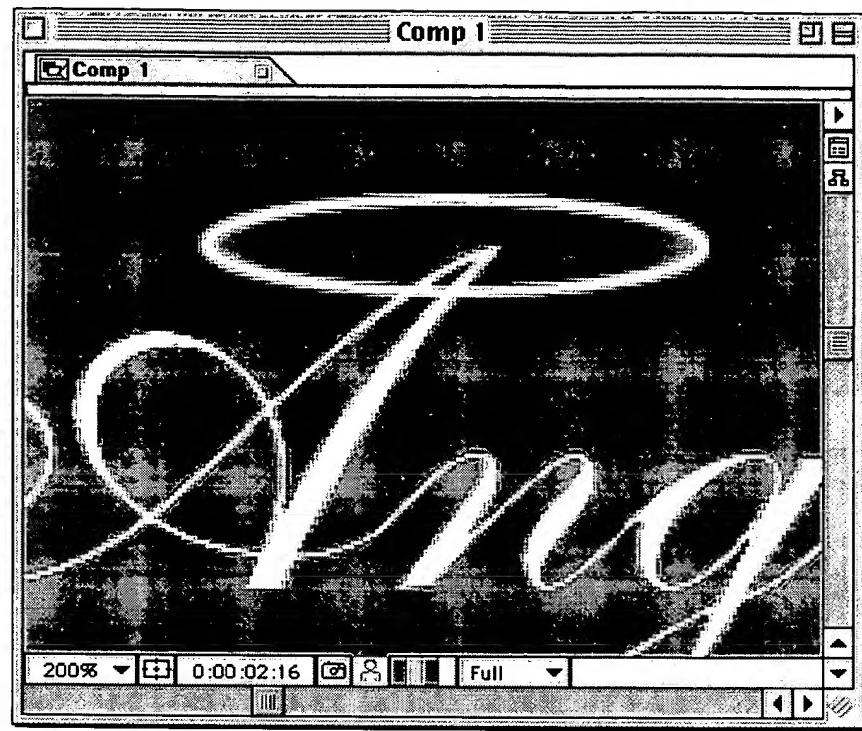
## Importing Files with Alpha Channels

A file containing an alpha channel can be saved in two ways: as straight alpha or premultiplied alpha. When you import a file containing an alpha channel, After Effects tries to detect a label indicating whether the alpha is straight or premultiplied. If the alpha is unlabeled, After Effects prompts you with an Interpret Footage Dialog box in which you manually select how to interpret the alpha. You may choose to ignore the alpha, interpret it as straight, premultiplied with black, premultiplied with white, or allow After Effects to guess the type of alpha.

If you know how you want to interpret the alpha of the footage you import, you can select a default interpretation. You can also change the interpretation of a footage file after you import it.

If you interpret the alpha channel incorrectly, footage may appear with an unwanted black or white halo or fringe around the edges of objects (Figure 2.37). Incorrect interpretation could also cause color inaccuracies. If you need guidance in correctly interpreting footage containing an alpha channel, see the sidebar, "Alpha Bits: Understanding Straight and Premultiplied Alpha," later in this chapter.

**Figure 2.37. Misinterpreting the type of alpha results in an unwanted halo or fringe around objects. Note the dark fringe around the letters, and the darkness in the transparency.**

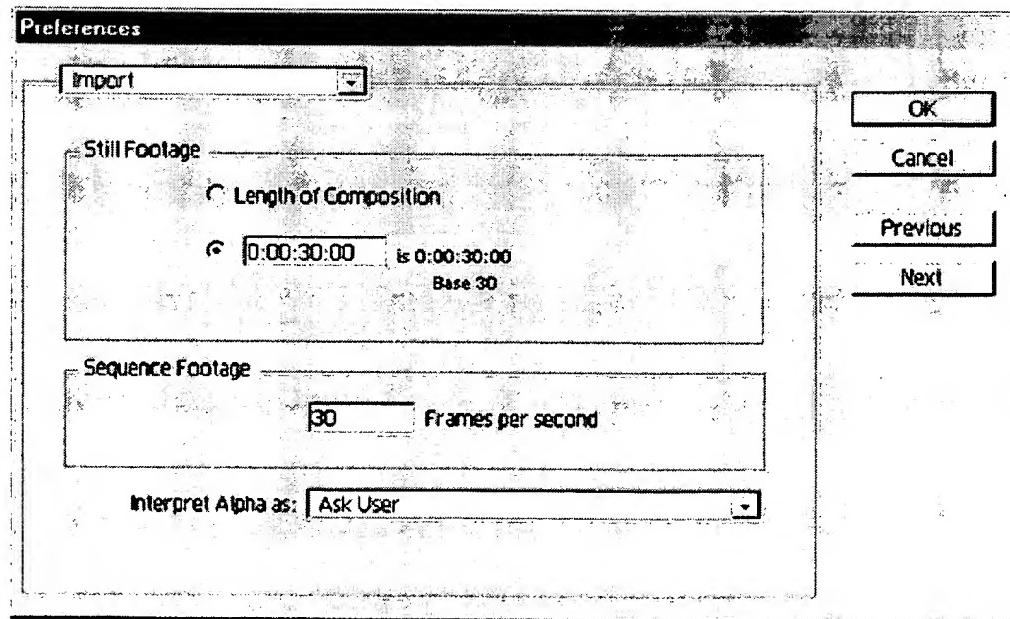


**To set the default alpha interpretation:**

1. Choose File > Preferences > Import

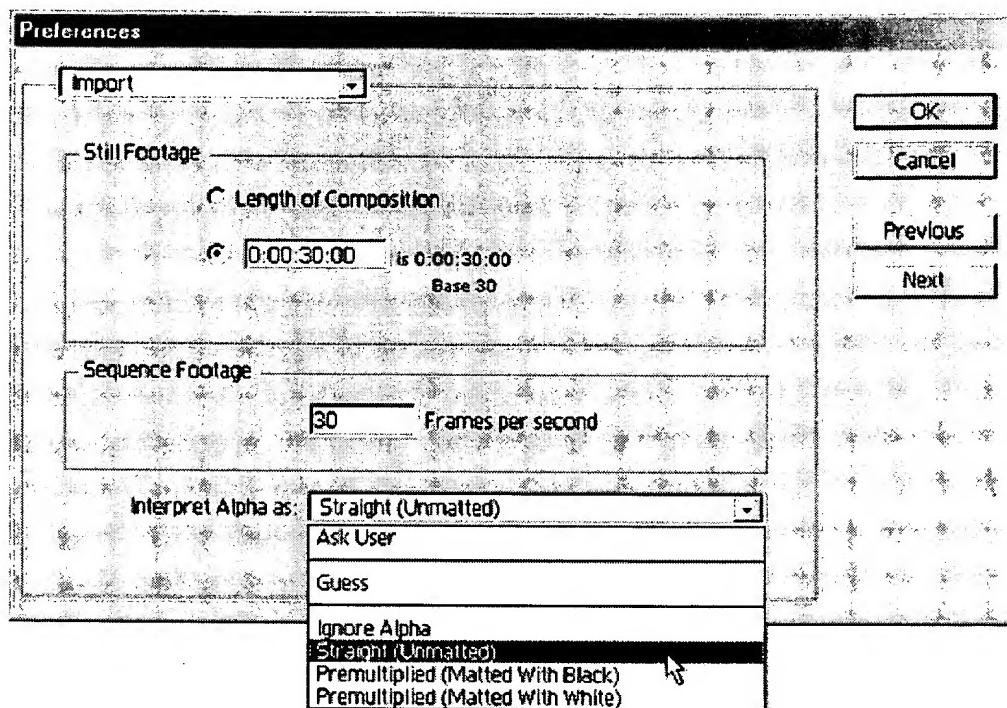
The Import panel of the Preferences dialog box appears (Figure 2.38).

**Figure 2.38. The Import panel of the Preferences dialog box appears.**



2. Choose a default interpretation method from the Interpret Alpha As pull-down menu (Figure 2.39):

**Figure 2.39. Choose a default interpretation method from the pull-down menu.**



**Ask User**— prompts you to choose an interpretation method each time you import footage with an unlabeled alpha channel.

**Guess**— After Effects attempts to automatically detect the type of alpha channel used by the file. If After Effects can't make a confident guess, it beeps at you.

**Ignore Alpha**— After Effects disregards the alpha channel of imported images.

**Straight (Unmatted)**— After Effects interprets the alpha channel as straight alpha. Choose this option for a single Photoshop layer with an alpha or layer mask.

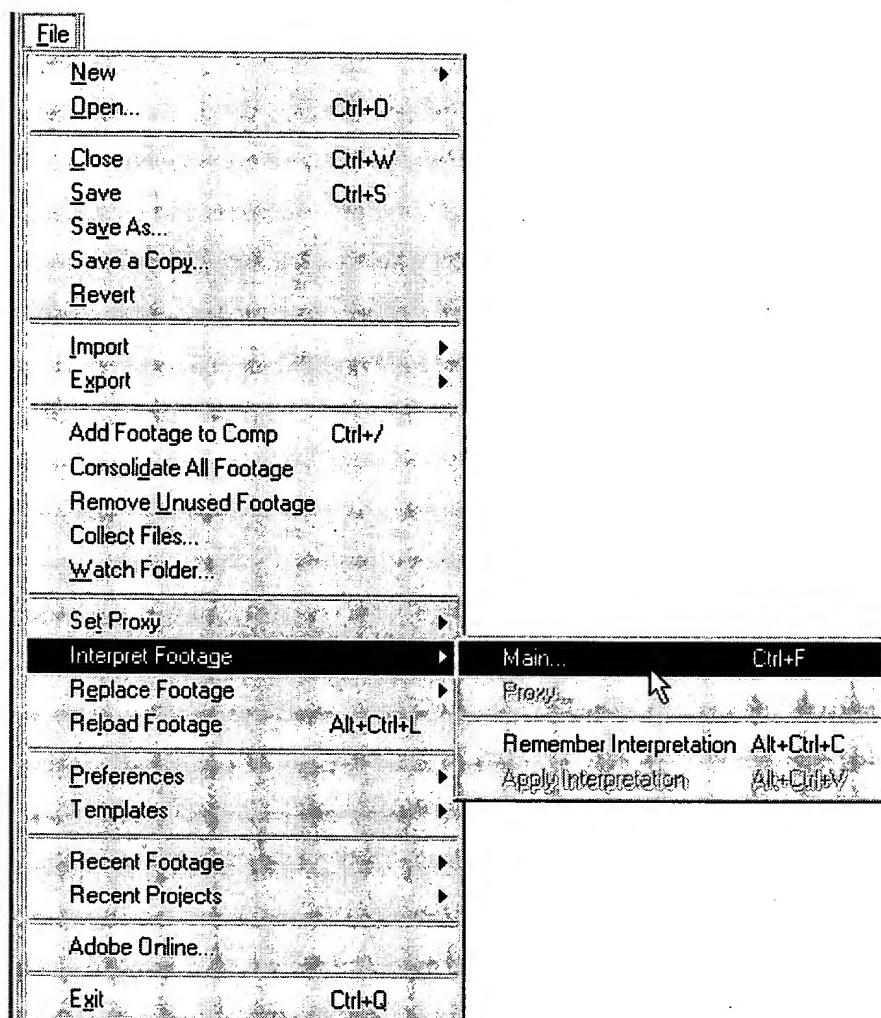
**Premultiplied (Matted With Black)**— Interprets the alpha channel as premultiplied with black.

**Premultiplied (Matted With White)**— Interprets the alpha channel as premultiplied with white. Choose this option for importing merged Photoshop layers that use transparency.

3. Click OK to close the Preferences dialog box.

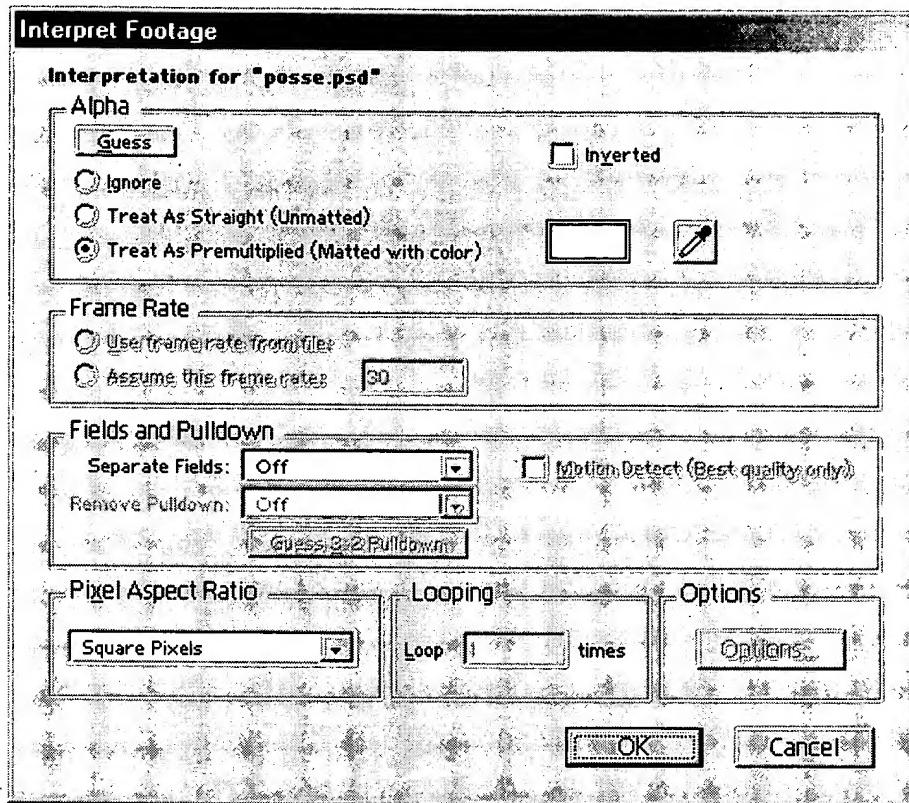
#### To set the alpha channel interpretation for a file in a project:

1. In the Project window, select a file containing an alpha channel.
2. Choose File > Interpret Footage > Main (Figure 2.40).

**Figure 2.40. Choose File > Interpret Footage > Main.**

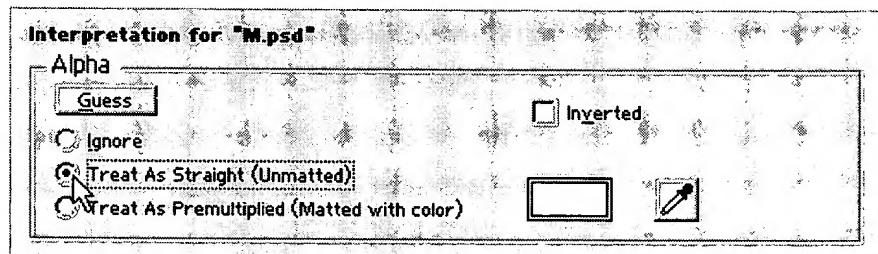
The Interpret Footage dialog box appears (Figure 2.41).

**Figure 2.41. The Interpret Footage dialog box appears.**



- In the Interpret Alpha section of the Interpret Footage dialog box, choose an interpretation method (Figure 2.42).

**Figure 2.42. Choose an alpha channel interpretation method from the Interpret Footage dialog box.**



If the options are grayed out, then the footage does not contain an alpha channel.

- Click OK to close the Interpret Footage dialog box.

#### Tip

If an unexpected fringe or halo appears around the edges of a composited image, you should change the alpha interpretation.

**Tip**

Internally, After Effects works in 32-bit depth (using 8-bit channels). If the color space of a footage item is less—as with a grayscale image—After Effects converts it to 32-bit when it displays. Similarly, if the footage doesn't contain an alpha channel, After Effects automatically supplies a full white alpha channel (which defines the image as fully opaque and visible).

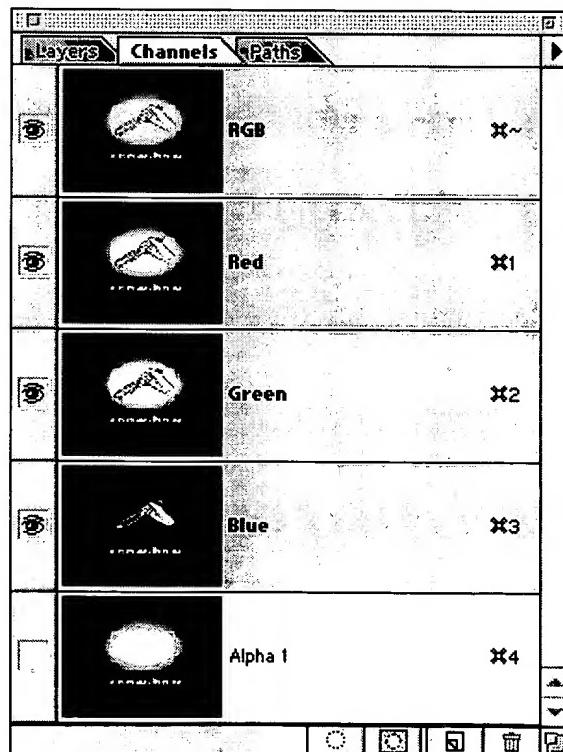
**Tip**

Kodak Cineon files use 10-bit channels. Because After Effects only supports 8-bit channels, you must use After Effects specialized Cineon tools to work with these files successfully. See Chapter 15 for more about working with Cineon files.

### Alpha Bits: Understanding Straight and Premultiplied Alpha

After Effects supports up to 32-bit files in RGB color mode. In RGB color, each channel—red, green, and blue—uses 8 bits, for a total of 24 bits (which yields millions of colors). A 32-bit file contains a fourth 8-bit channel, known as an *alpha channel*. While the RGB channels define the visible color of each pixel in the image, the alpha channel defines their transparency. The alpha channel is usually depicted as a grayscale matte, where black defines a pixel as transparent, white as opaque, and gray as semitransparent. After Effects and other programs can utilize the alpha channel to make parts of an image transparent. To those who already use one of these other programs, such as Photoshop, these concepts are all too familiar (Figure 2.43).

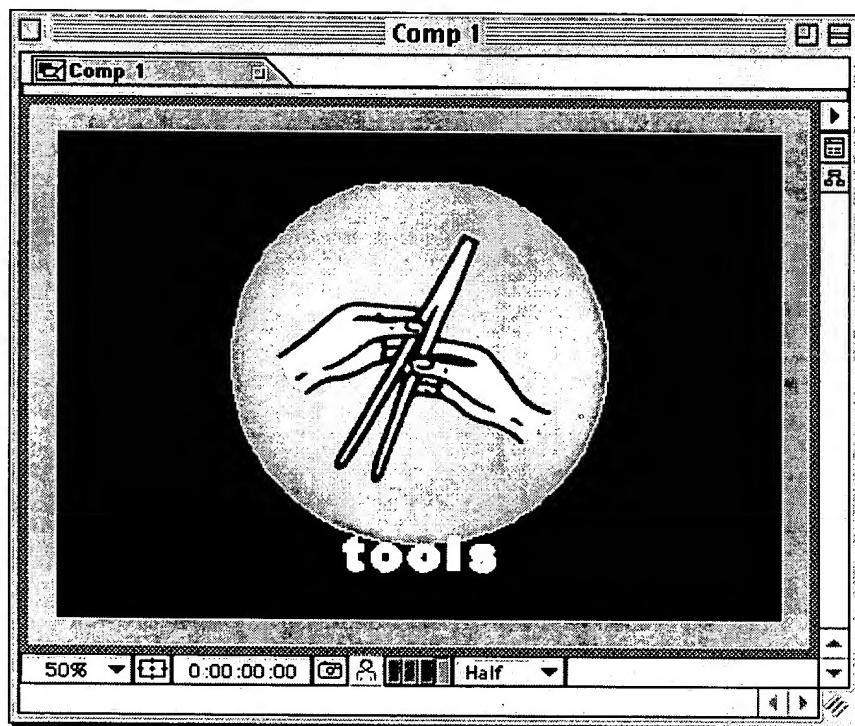
**Figure 2.43. The channels of a 32-bit image, as viewed in Photoshop.**



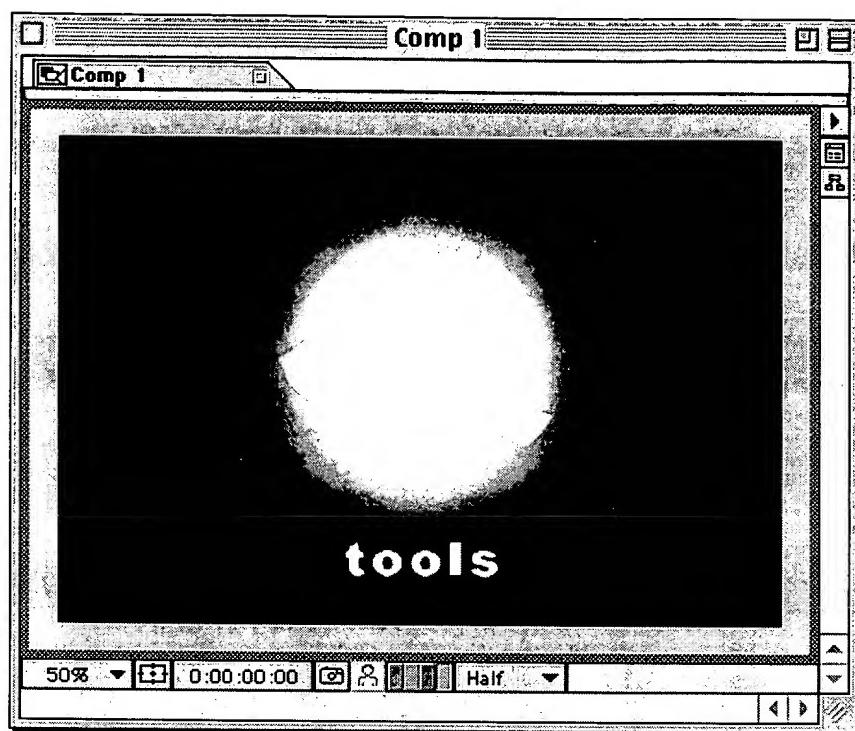
Less widely known, however, are the two ways files containing an alpha channel can be saved: as *straight alpha* or *premultiplied alpha*. In both types of files, the alpha is the same. However, they differ in how the visible channels factor in the transparency information.

A file saved with a *straight alpha* channel stores transparency information strictly in the alpha channel, not in any of the visible color channels. Ordinarily, you see the RGB channels combined, or multiplied, with the alpha channel. In After Effects, however, you can see the color information without the alpha channel (or an *unmultiplied* RGB image) by Shift-clicking the alpha channel switch in the Layer window. Because the RGB channels do not account for the transparency information, the color information bleeds across areas that the alpha channel defines as semitransparent. The all-or-nothing RGB channels of a straight alpha image look bad by themselves, but when they're combined with the alpha channel, transparent areas and soft edges are perfectly represented (Figure 2.44, Figure 2.45 and Figure 2.46). Incorrectly interpreting a straight alpha as premultiplied causes semitransparent objects to appear more opaque and brighter than they should.

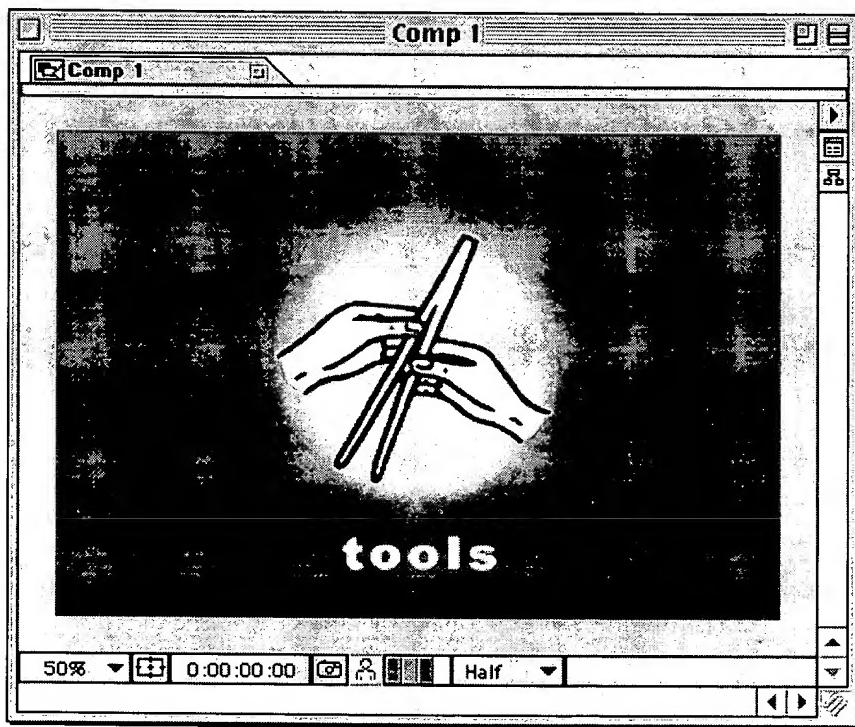
**Figure 2.44. The RGB channels of an image with a straight alpha do not factor in transparency. If you Shift-click the alpha switch of the Footage window, you can see how the unmultiplied color information bleeds across transparent areas.**



**Figure 2.45. An image with a straight alpha stores transparency information strictly in the alpha channel. You can view the alpha channel if you simply click the alpha switch (without the Shift key) in the Footage window.**



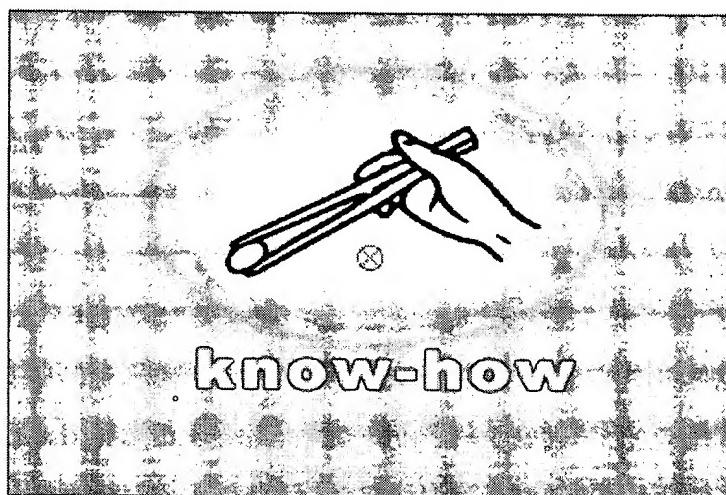
**Figure 2.46.** In the final composite, the RGB and the alpha channel create smooth edges and trans parencies.



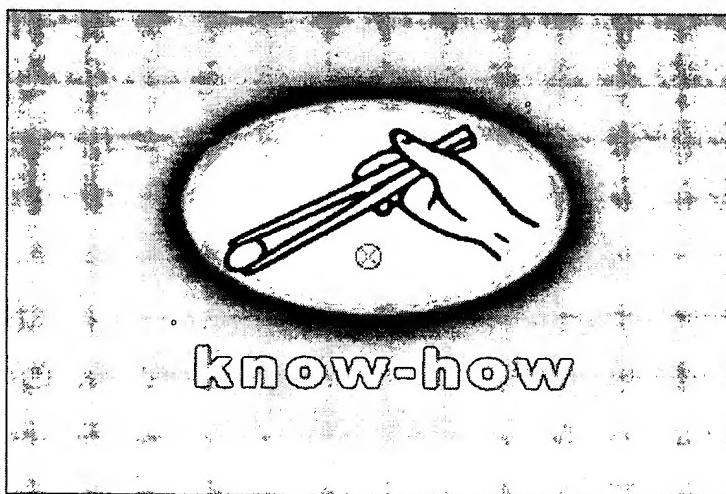
A file saved with a *premultiplied alpha* also stores transparency values in the alpha channel.

However, the RGB channels take the transparency information into account as well. In semi-transparent areas (including anti-aliased edges), the RGB channels are mixed—or multiplied—with the background color (usually black or white). Instead of bleeding across transparent areas, the RGB colors fade to the background color according to the amount of transparency. This is why incorrectly interpreting a premultiplied alpha as straight causes objects to appear with a black or white halo or fringe around them. After Effects correctly interprets premultiplied alpha by "unmultiplying" or removing the background color before it composites the image (Figure 2.47, Figure 2.48, and Figure 2.49).

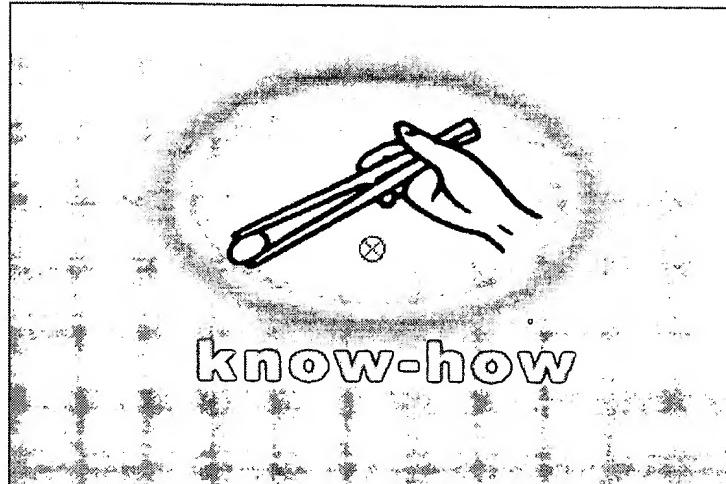
**Figure 2.47.** In an image with premultiplied alpha, RGB colors are mixed with a background color, according to the amount of transparency. Correctly interpreted, transparent areas composite smoothly.



**Figure 2.48.** Incorrectly interpreting the alpha as matted with white results in a dark halo, revealing how the colors are actually matted with black.



**Figure 2.49.** Incorrectly interpreting the alpha as straight has a similar effect.



Although it achieves great results from foot age that use either kind of alpha, After Effects works internally with straight alpha. Because straight alpha is native to After Effects, many consider it to be more precise—and more desirable—than premultiplied alpha.

Straight alpha is also known as *unmatted alpha*. Premultiplied alpha is also called *matted*, or *preshaped alpha*.

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### Layer Mode Types

This section describes layer modes in the order they appear in the Modes pull-down menu, and groups them into loose categories. Note that most modes are based on the pixel values of visible channels, not transparency information. However, modes in the transparency, stencil and silhouette, and alpha manipulation categories do alter alpha channels.

The result of a layer mode depends on various aspects of the image to which it's applied, as well as aspects of the underlying image. Each mode may be better suited to certain types of images, and vice versa. For the sake of comparison, each mode in the following examples is applied to the image in Figure 12.15, to blend it with the underlying image in Figure 12.16. Of course, these black and white figures can't represent how modes affect the final color. But it's more important that you understand the description of what information the mode uses to calculate the final image; you can always see the full-color results for yourself.

**Figure 12.15. In the following examples, each mode is applied to this image, which is arranged higher in the stacking order.**



**Figure 12.16. This image is used as the underlying image, lower in the stacking order.**



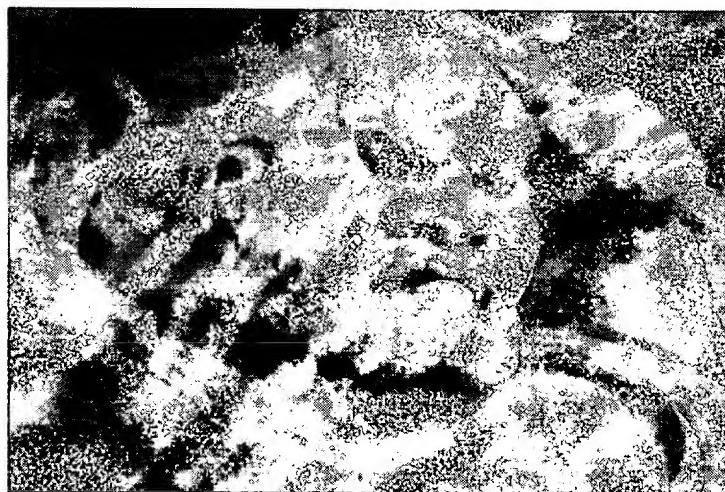
## Transparency Modes

Transparency modes alter the alpha channel of the layer to combine it with the underlying image.

**Normal** is the default layer mode. The layer combines with underlying layers according to its opacity setting.

**Dissolve** replaces pixels of the layer with underlying pixels, based on the layer's opacity value. Unlike using the Normal mode, pixels are either completely transparent or completely opaque. Therefore, this mode ignores partial transparency, including feathered masks. At 100% opacity, this mode has no effect; a lower opacity value makes more of the pixels transparent. This mode was designed to emulate the dissolve transition found in programs like Macromedia's Director (Figure 12.17).

**Figure 12.17. Dissolve mode, with the image opacity set to 50 percent**



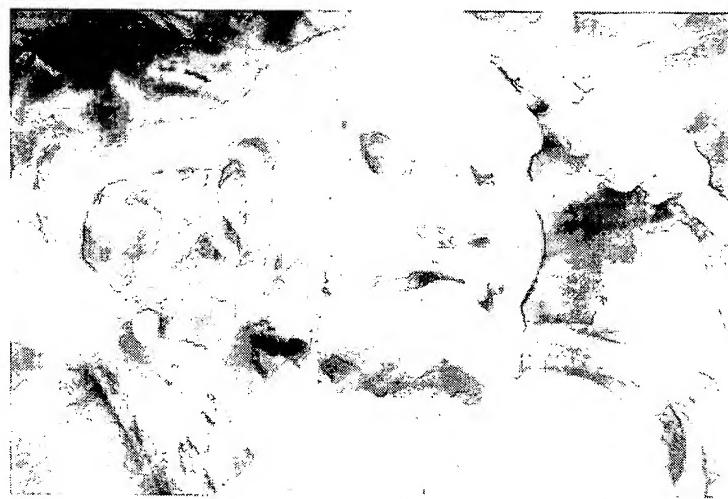
**Dancing Dissolve** works like the Dissolve mode, except that the position of transparent pixels varies over time, even if the opacity value of the layer remains the same.

## Brightness Modes

The following modes affect the brightness of resulting image.

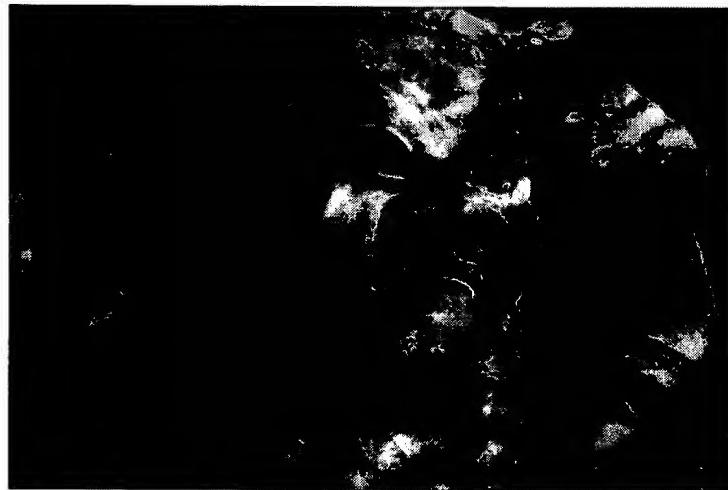
**Add** combines the brightness values of the layer with the underlying image, resulting in a brighter image overall. Purely black areas in the layer reveal the underlying image unchanged; purely white areas in the underlying image show through unchanged (Figure 12.18).

**Figure 12.18. Add.**



**Multiply** multiplies the color values of the layer with the color values of the underlying image, and divides by 255. Therefore, the resulting value is darker than the two, and never brighter than the original. When applied to a high-contrast black-and-white image, Multiply preserves the black areas, and allows the underlying image to show through the white areas of the layer. (Remember, though, that the alpha is not affected) (Figure 12.19).

**Figure 12.19. Multiply.**



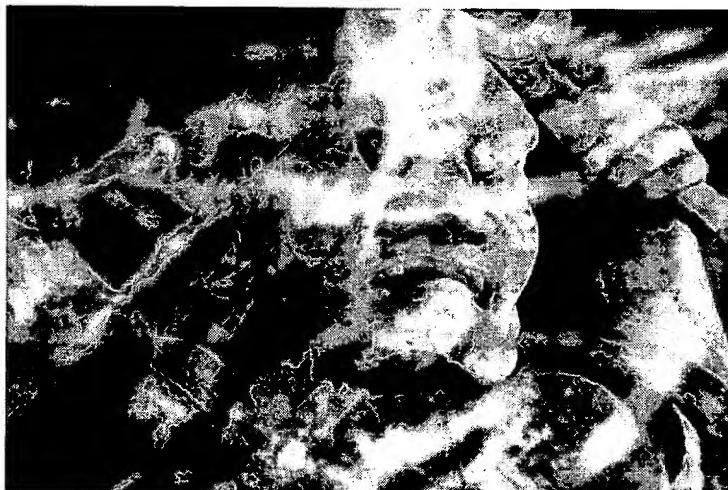
**Screen** is the opposite of the Multiply mode. Screen mode multiplies the inverse brightnesses of the layer and underlying image, and divides the result by 255. The result is brighter than the two, and never darker than the original. Screen is particularly useful for compositing an image on a black background with the underlying image (Figure 12.20).

**Figure 12.20. Screen.**



**Overlay** multiplies areas darker than 50 percent gray, and screens areas brighter than 50 percent gray. Therefore, dark areas become darker; bright areas become brighter. Colors mix with the underlying colors, increasing saturation. Middle grays allow underlying pixels to show through unaffected. As a result, the underlying layer tends to be more visible (Figure 12.21). Overlay is a favorite mode to create attractive blends, and can also be useful when applied to a solid color.

**Figure 12.21. Overlay.**



**Soft Light** lightens the layer when the underlying image is lighter than 50 percent gray and darkens the layer when the underlying image is darker than 50 percent gray. However, black pixels in the layer never result in pure black, nor do white pixels result in pure white. The underlying image dominates the resulting image, and has diminished contrast (Figure 12.22).

**Figure 12.22. Soft Light.**



**Hard Light** multiplies the layer when the underlying pixels are darker than 50 percent gray and screens the layer when underlying pixels are lighter than 50 percent gray. As the name indicates, the result is a harsher version of soft light, so the layer comes through more strongly than the underlying image (Figure 12.23).

**Figure 12.23. Hard Light.**



## Dodge and Burn Modes

Dodge and burn are terms borrowed from photography (and can also be found in Photoshop).

**Color Dodge** uses the color values—not just the brightness—of the layer to brighten the underlying image, which dominates the resulting image. Black areas of the layer allow the underlying image to show through unaffected; white areas brighten the underlying image (Figure 12.24). *Dodging* refers to the technique of blocking light from a photographic print, protecting the white paper from exposure, and allowing the area to remain lighter.

**Figure 12.24. Color Dodge.**



**Color Burn** uses the color values of the layer to darken the underlying image, which dominates the resulting image. White areas of the layer allow the underlying image to show through unaffected, while dark areas darken the underlying image (Figure 12.25). *Burning* refers to the technique of exposing a photographic print to light longer, in order to darken areas of the image.

**Figure 12.25. Color Burn.**



## **Value Recalculation Modes**

The following modes recalculate the color values, often resulting in stylized or exaggerated combinations.

**Darken** compares the color values of each channel of the layer with those of the underlying image and takes the darker of the two. Because the values of individual channels are compared, colors can shift drastically (Figure 12.26).

**Figure 12.26. Darken.**



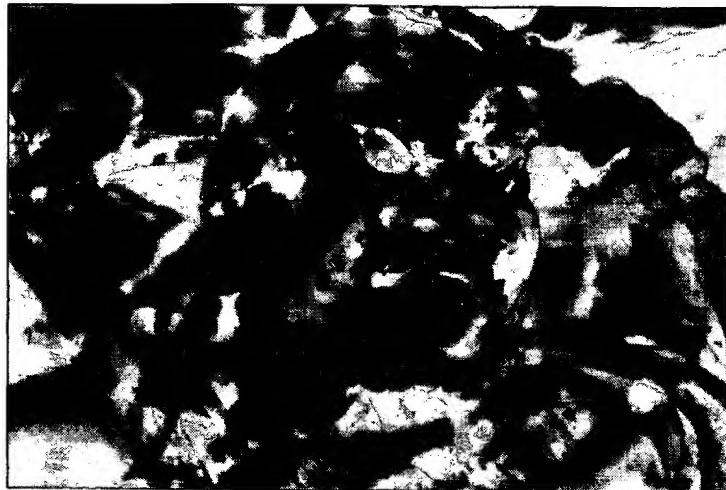
**Lighten** compares the color values of each channel of the layer with those of the underlying image and takes the lighter of the two. Because the values of individual channels are compared, colors can shift drastically (Figure 12.27).

**Figure 12.27. Lighten.**



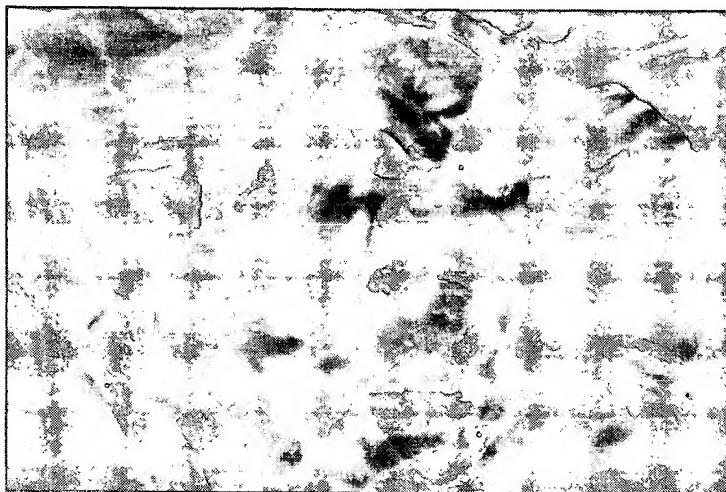
**Difference** subtracts the layer's channel values from those of the underlying image, and displays the absolute value. Because the values of individual channels are compared, colors can shift drastically. However, where the layer is very similar to the underlying image, the result is black (Figure 12.28). For this reason, Difference mode can be used to create a matte (in much the same way you use the difference matte in Adobe Premiere). When a scene with a subject is combined with a clean scene (without the subject) only the difference appears in the resulting image.

**Figure 12.28. Difference.**



**Exclusion** combines layers in a similar fashion as Difference mode, except that similar values appear gray, rather than black (Figure 12.29).

**Figure 12.29. Exclusion.**



## Value-Swapping Modes

The following modes replace certain calculated color values of the layer with values from the underlying image. The name indicates the value that's preserved in the layer to which you apply the mode.

**Hue** uses the hue of the layer and the saturation and luminance of the underlying image to create the resulting image (Figure 12.30).

**Figure 12.30. Hue.**



**Saturation** uses the saturation of the layer and the hue and luminance of the underlying image to create the resulting image (Figure 12.31).

**Figure 12.31. Saturation.**



**Color** uses the hue and saturation of the layer and the luminance of the under lying image to create the resulting image (Figure 12.32).

**Figure 12.32. Color.**



**Luminosity** uses the luminance of the layer and the hue and saturation of the underlying image to create the resulting image (Figure 12.33).

**Figure 12.33. Luminosity.**



## Stencil and Silhouette Modes

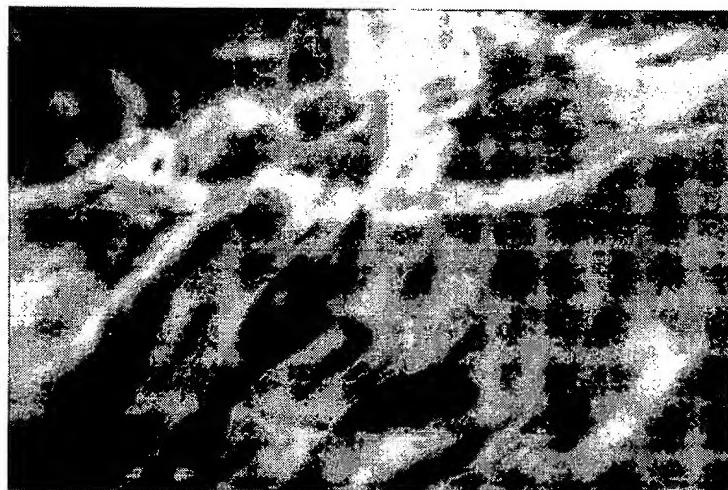
Stencil and Silhouette modes use either the layer's alpha or luminance values to alter the alpha channel of the underlying image, cutting a hole through some areas, while leaving other areas black. As you may guess from their names, stencil and silhouette are inverse versions of one another. Unlike a matte (see "Track Mattes," later in the chapter), Stencil and Silhouette modes cut a hole through all the lower layers in the stacking order, not just the next one down.

In these examples, the image in Figure 12.34 contains an alpha channel that cuts out the statue, and Figure 12.35 serves as the underlying image.

**Figure 12.34. This image contains an alpha channel that isolates the statue.**



**Figure 12.35.** This image again serves as the background image.



**Stencil Alpha** uses the layer's alpha channel to cut a hole through the layer, revealing lower layers through it. The area outside the stenciled area becomes transparent (Figure 12.36).

**Figure 12.36. Stencil Alpha.**



**Stencil Luma** uses the layer's luminance channel to cut a hole through the layer. Lighter areas are more opaque, and darker areas are more transparent, revealing lower layers. The area outside the stencil becomes transparent (Figure 12.37).

**Figure 12.37. Stencil Luma.**



**Silhouette Alpha** is the inverted version of Stencil Alpha. The alpha channel defines the black portion of the image (the shadow of the silhouette), and everything outside this area reveals the layers below (Figure 12.38).

**Figure 12.38. Silhouette Alpha.**



**Silhouette Luma** is the inverted version of Stencil Luma. The luminance of the layer defines the black portion of the image: darker areas of the layer are more opaque, lighter areas are more transparent (Figure 12.39).

**Figure 12.39. Silhouette Luma.**

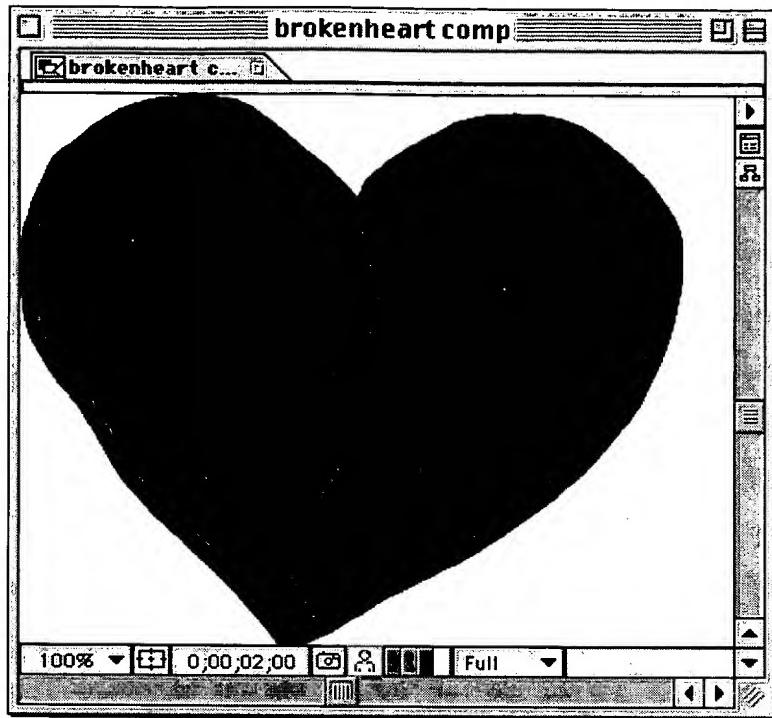


## Alpha Manipulation Modes

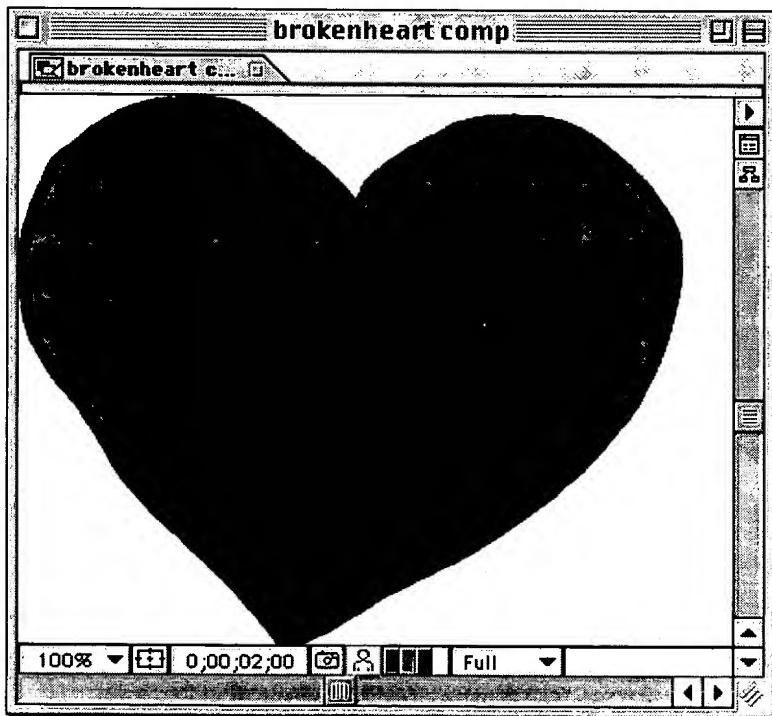
The following modes also alter the alpha channel of the layer and underlying images, and their uses are rather specialized.

**Alpha Add** combines alpha channels to create a seamless transparent area. When the edges of alpha channels are aligned but either inverted or **anti-aliased**, Alpha Add can remove the visible seam between them (Figure 12.40 and Figure 12.41).

**Figure 12.40. When the edges of alpha channels are aligned but either inverted or anti-aliased...**



**Figure 12.41. ...Alpha Add can remove the visible seam between them.**

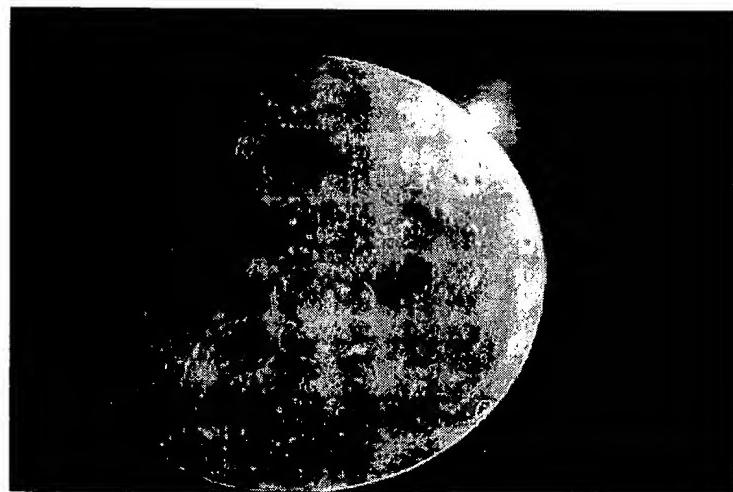


**Luma Premultiply** prevents the edges of elements that use a premultiplied alpha channel from clipping when composited with other layers. In other words, compositing a layer that is premultiplied with a color results in an image that looks bright around the edges. In this event, try changing the interpretation to straight and applying the Luma Premultiply mode (Figure 12.42 and Figure 12.43).

**Figure 12.42. The lens flare layer contains a premultiplied alpha that is actually brighter than the RGB channels.**



**Figure 12.43. Changing the interpretation to straight and applying the Luma Premultiply mode prevents clipping in the alpha and reveals the detail of lighting effect.**



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### Output > Choosing Render Settings

## Choosing Render Settings

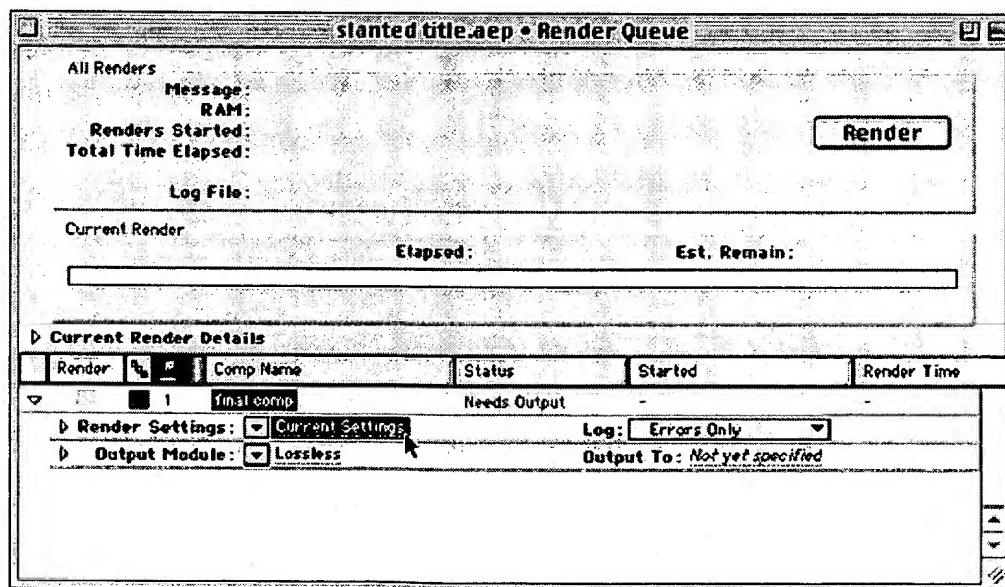
The render settings comprise the first step in the rendering process. Render settings dictate how each **frame** of the composition is calculated for the final output, in much the same way the composition's settings calculate **frames** for playback in the Composition window.

Initially, the render settings are set to match the composition's current settings. Though the current settings may meet your output goals in some instances, it's best to take a more active role in choosing render settings. Selecting each render setting or using a template of settings ensures that every layer of the composition—including layers in nested compositions—use the settings you want before they are saved to disk.

### To choose render settings manually:

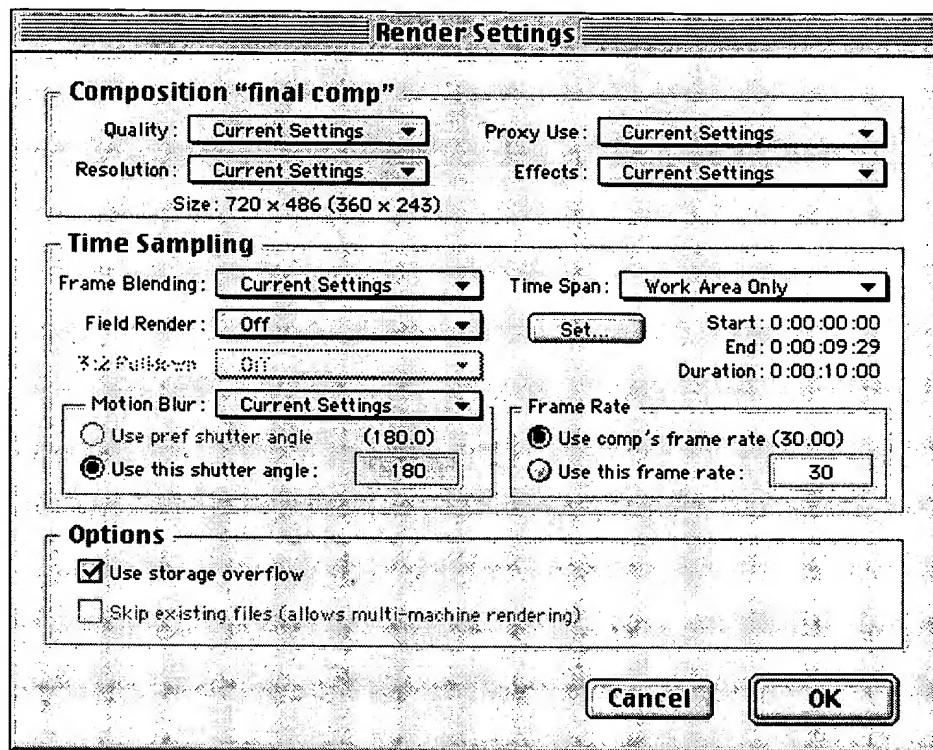
1. In the render queue, click the underlined name of the render settings (Figure 16.26).

**Figure 16.26. In the render queue, click the underlined name of the render settings.**



A Render Settings dialog box appears (Figure 16.27).

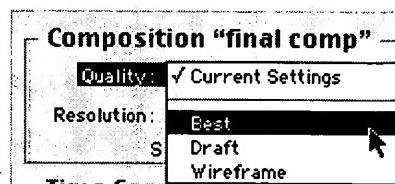
**Figure 16.27.** In the Render Settings dialog box, specify various settings for rendering the frames of the composition.



2. In the Render Settings dialog box, make a selection for each of the following options:

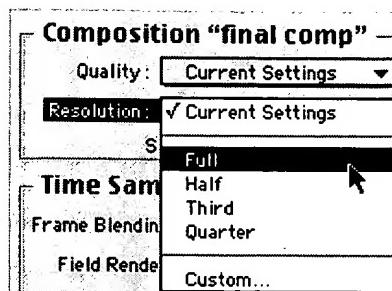
**Quality** sets the quality for all layers. (See "Quality Setting Switches," in Chapter 5.) (Figure 16.28).

**Figure 16.28.** Set the quality setting for all layers from the Quality pull-down menu.



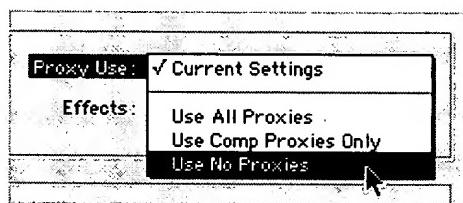
**Resolution** sets the resolution for all layers in the composition. (See "Resolution," in Chapter 4.) Setting the resolution to half, for example, renders every other pixel and results in an image half the dimensions of the full-sized composition (Figure 16.29).

**Figure 16.29.** Set the resolution for all layers in the composition in the Resolution pull-down menu.



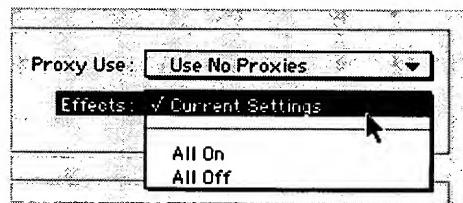
**Proxy Use** specifies whether proxies or source footage will be used for output (Figure 16.30). (See "Using Proxies and Placeholders," in Chapter 3.)

**Figure 16.30. Specify whether proxies or source footage will be used for output in the Proxies pull-down menu.**



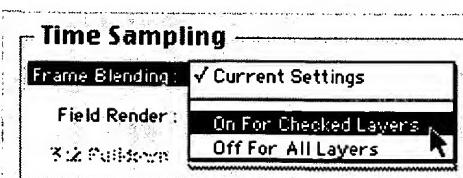
**Effects** specifies whether effects will appear in the output. (See "Enabling and Disabling Effects," in Chapter 10.) Set Effects to All On to enable all effects, including ones you had disabled temporarily; set to Current to exclude effects you disabled deliberately (Figure 16.31).

**Figure 16.31. In the Effects menu, specify whether effects will appear in the output.**



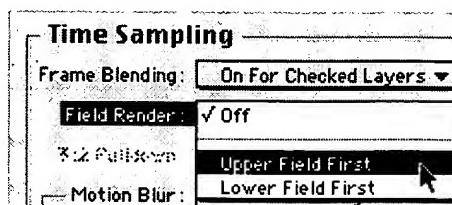
**Frame Blending** specifies whether **frame blending** will be applied to layers with the **Frame Blending** switch enabled (regardless of the **Frame Blending** setting for the composition) (Figure 16.32). (See "Using Frame Blending," in Chapter 12.)

**Figure 16.32. In the Frame Blending pull-down menu, specify whether frame blending will be applied to layers with the Frame Blending switch enabled.**



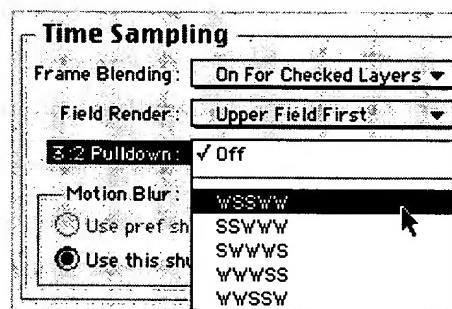
**Field Render** specifies whether to field render the output movie, and if so, which field is dominant. (See the sidebar, "Interlaced Video and Field Order," in Chapter 2.) Set to None unless the output is destined for video (Figure 16.33).

**Figure 16.33.** In the Field Render pull-down menu, choose whether to field render the output.



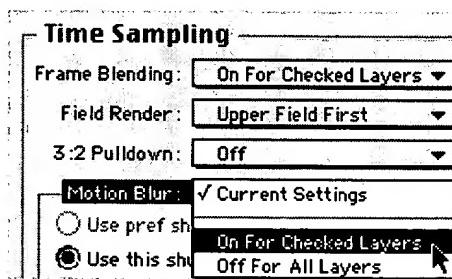
**3:2 Pulldown** specifies whether to reintroduce pulldown to the footage, and determines the phase of the pulldown. (See the sidebar, "The Lowdown on Pulldown," in Chapter 2.) Selecting the proper phase is only required if the movie will be cut back into the original footage (Figure 16.34).

**Figure 16.34.** To reintroduce pulldown to the footage, choose an option from the 3:2 Pulldown menu.



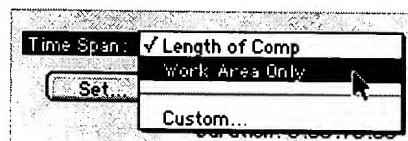
**Motion Blur** specifies whether motion blur will be applied to layers with the Motion Blur switch enabled (regardless of the Motion Blur setting for the composition). When you enable motion blur, choose either the preferred shutter angle or enter a custom shutter angle. (See "Using Motion Blur," in Chapter 12.) A setting of 360 degrees results in the maximum motion blur (Figure 16.35).

**Figure 16.35.** In the Motion Blur pull-down menu, specify whether motion blur will be applied to layers with the Motion Blur switch enabled.



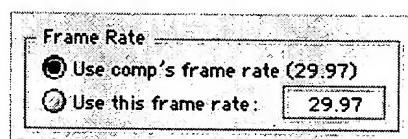
**Time Span** defines the part of the composition for output. Choosing Custom from the Time Span pull-down menu or clicking the Set button opens a Custom Time Span dialog box (Figure 16.36). (See "Setting the Work Area" in Chapter 8.)

**Figure 16.36. Define the part of the composition for output in the Time Span pull-down menu.**



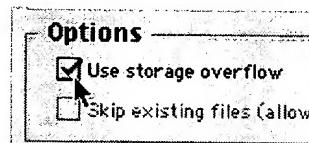
**Frame Rate** sets the **frame** rate used to render the composition. You may select the **frame** rate of the composition, or enter a custom **frame** rate. (See "Frame Rate," in Chapter 4.) As you recall from Chapter 4, the **Frame** Rate setting does not affect the speed of playback, just the smoothness (Figure 16.37).

**Figure 16.37. Select the frame rate of the composition, or enter a custom frame rate.**



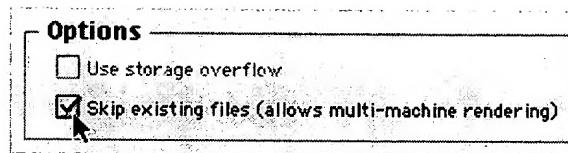
**Use Storage Overflow** sets whether rendering continues to an overflow volume when the output file exceeds the capacity of the first storage volume (Figure 16.38). (See "Setting Overflow Volumes," later in this chapter.)

**Figure 16.38. Check Use Storage Overflow to ensure rendering continues to an overflow volume when the output file exceeds the capacity of the first storage volume.**



**Skip Existing Files** enables After Effects to render or re-render **frames** of an existing **frame** sequence. This option also allows multiple computers to render parts of the same image sequence to a Watch folder (Figure 16.39). (Consult your After Effects documentation for more about network rendering features.)

**Figure 16.39. Check Skip Existing Files to enable After Effects to render or re-render frames of an existing frame sequence.**



3. Click OK to close the Render Settings dialog box and return to the Render Queue window.

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**Output > Choosing Output Module Settings**

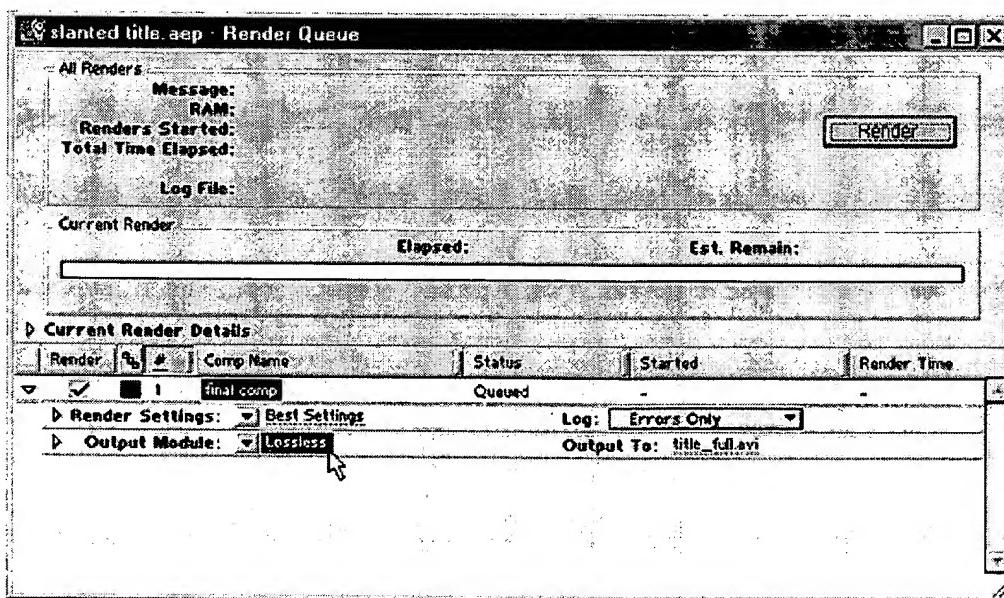
## Choosing Output Module Settings

The output module settings comprise the second step in the movie-making process. Once the frames are processed, these settings determine how they will be saved.

**To choose an output module manually:**

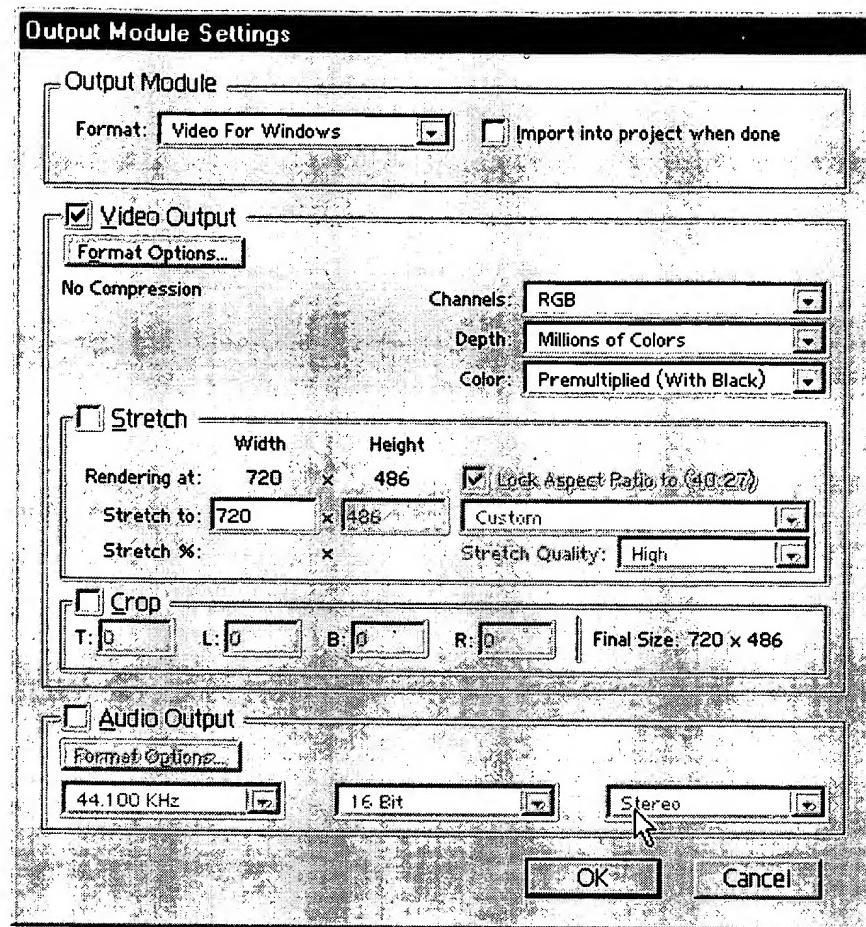
1. In the render queue, click the underlined name of the output module (Figure 16.40).

**Figure 16.40. In the render queue, click the underlined name of the output module.**



An Output Module Settings dialog box appears (Figure 16.41).

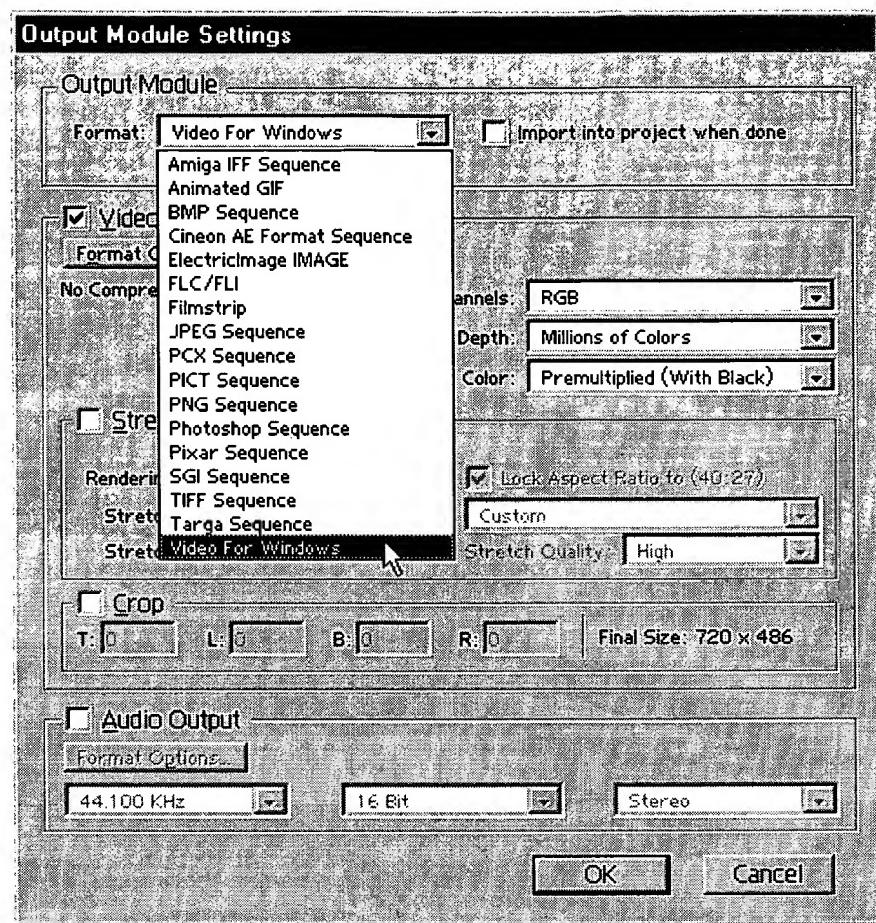
**Figure 16.41. An Output Module Settings dialog box appears.**



2. In the Output Module Settings dialog box, make a selection for each of the following options:

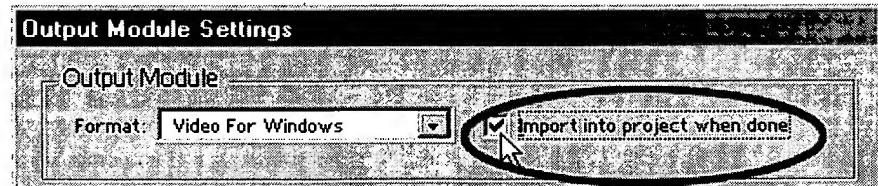
**Format** determines the file format of the output, and includes a variety of movie and still image sequence formats (Figure 16.42). Your particular project or equipment dictates your choice. However, QuickTime Movie or Video for Windows are common choices for motion files; TIFF or PICT sequences are commonly used still-image formats.

**Figure 16.42. Choose the format of the saved file in the Format pull-down menu.**



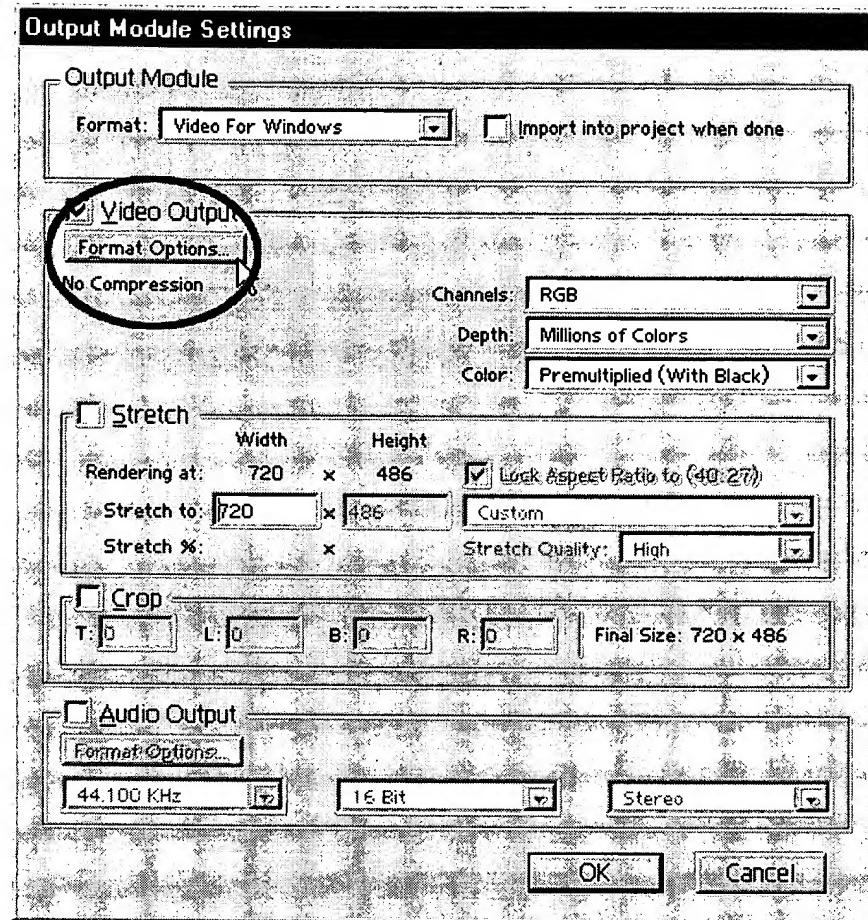
**Import into project when done** instructs After Effects to import the rendered composition back into the project (Figure 16.43). This is particularly useful when you are pre-rendering a composition for use in the project.

**Figure 16.43. Check Import into project when done to import the rendered composition back into the project.**



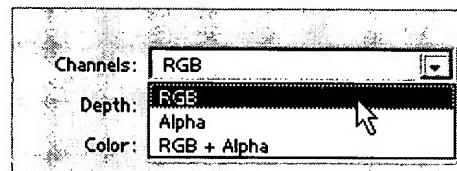
**Format Options** opens a dialog box that includes options associated with particular formats (Figure 16.44). For example, if you chose QuickTime Movie as the format, the Format Options button would open a Compression Settings dialog box for QuickTime movies. (See "Movie Files and Compression," later in this chapter.)

**Figure 16.44. Click Format Options to open a dialog box containing format-specific settings.**



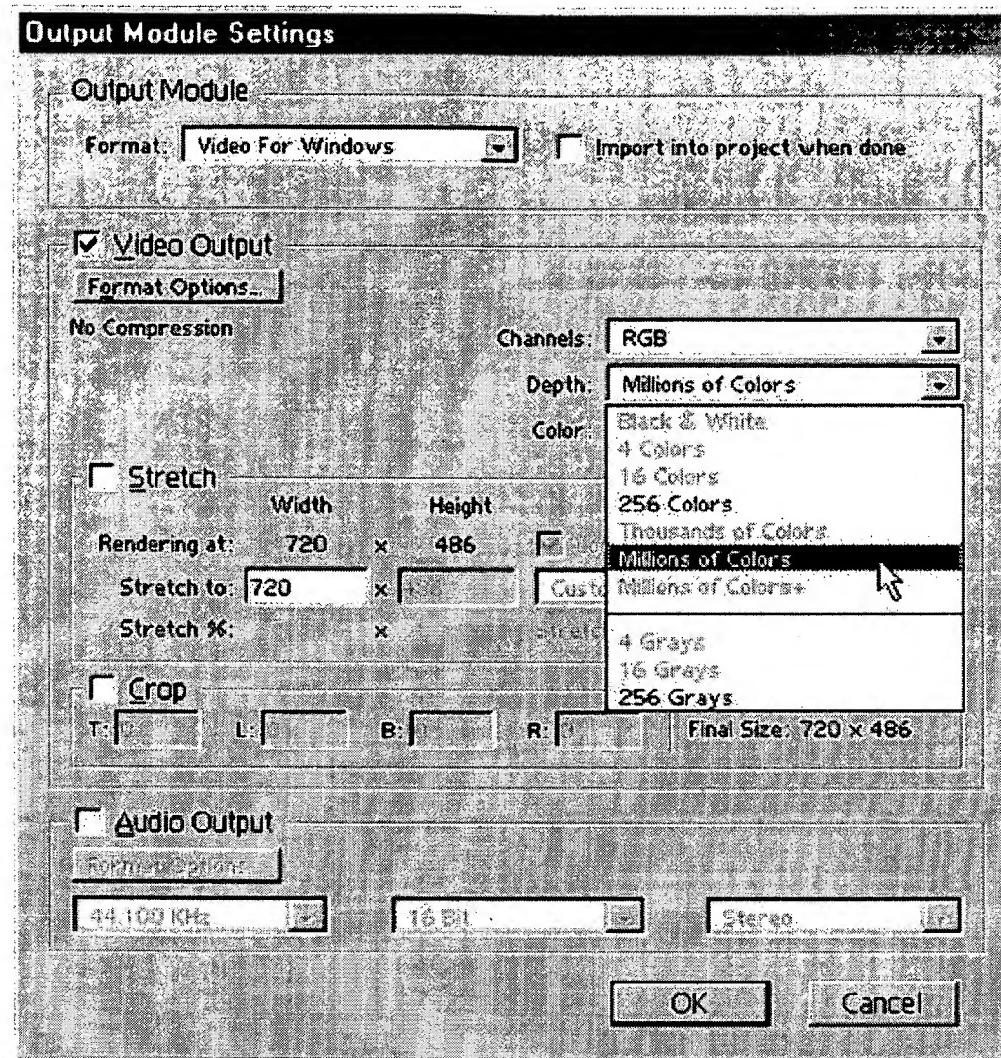
**Channels** specifies the channels present in the output (Figure 16.45). Depending on the format, you can choose to export the RGB channels, the alpha channel, or RGB + Alpha. (See the sidebar, "Alpha Bits," in Chapter 2.)

**Figure 16.45.** Specify the channels present in the output in the Channels pull-down menu.



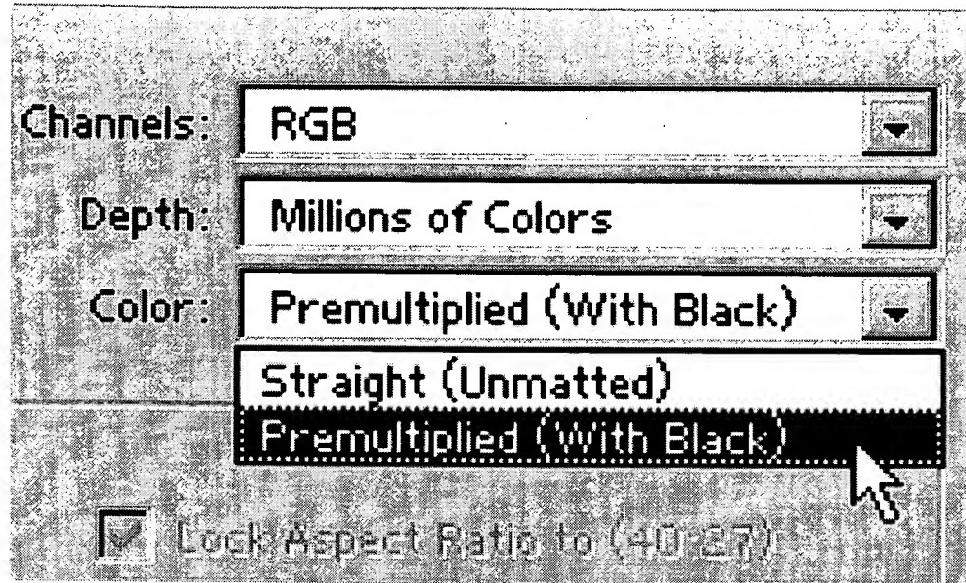
**Depth** specifies the color depth of the output. The available options depend on the format and channels you selected (Figure 16.46).

**Figure 16.46.** The options available in the Depth menu depend on the format and channels you selected.



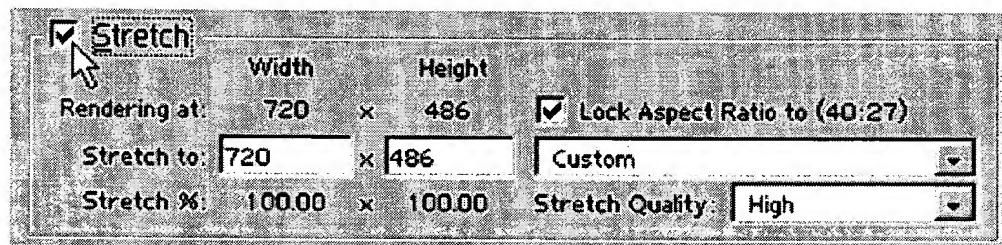
**Color** specifies how color channels factor in the alpha channel, if one is present; it determines whether the output uses a straight alpha, or is premultiplied with black (Figure 16.47). (See the sidebar, "Alpha Bits," in Chapter 2.)

**Figure 16.47. If you chose to output an alpha channel, use the Color pull-down menu to choose between straight alpha, or premultiplied with black.**



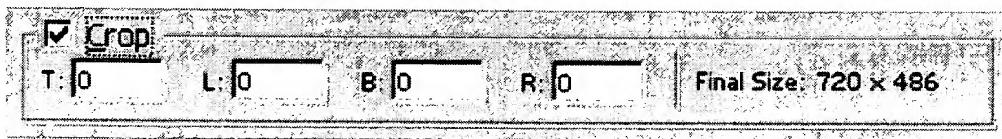
**Stretch** allows you to specify the frame size of the output. Checking the Stretch option allows you select common frame sizes from a pull-down menu, or enter custom dimensions. You may also choose between a low- and high-quality resizing method in the Stretch Quality pull-down menu. Stretch resizes the image after it has been rendered (Figure 16.48).

**Figure 16.48. Select stretch options to resize the image after it has been rendered.**



**Crop** allows you to add, or more likely, remove pixels from the edges of the image frame. Cropping is useful to remove the black edges from video footage (Figure 16.49). It can also be used to reverse field dominance (see the sidebar, "Reversing Field Order," in Chapter 2.)

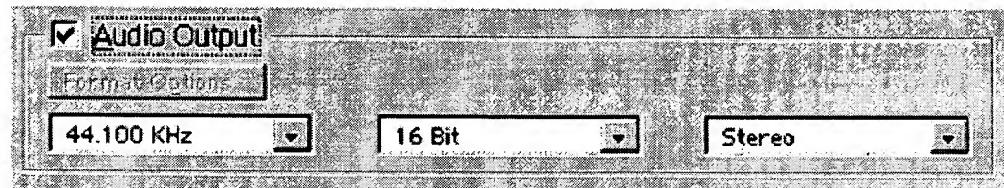
**Figure 16.49. Select crop options to add or remove pixels from the edges of the frame.**



**Audio Output** specifies the attributes of the audio track of the output, if any. Settings include

sample rate, bit depth, and format (mono or stereo). (For more about audio, see sidebars in Chapter 8.) Note that the Format Options button remains grayed out and doesn't permit you to apply audio compression (Figure 16.50). To compress the audio, you can use an option available under the Export command, or compress the final movie using a program such as QuickTime Pro or Media Cleaner Pro.

**Figure 16.50. Specify the sample rate, bit depth, and whether the audio track is stereo or mono.**



3. Click OK to close the Output Module dialog box and return to the Render Queue window.

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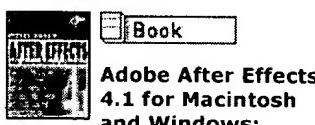
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### Compositions > Creating Compositions

## Chapter 4. Compositions

Without compositions, a project is merely a list of footage items: a grocery list, but not a recipe; an ensemble without choreography; finely tuned instruments without, well, a composition. More literally speaking, *compositions* describe how you arrange the footage items in space and in time.

In this chapter, you learn how to create a composition and define its spatial and temporal boundaries—settings such as frame size, frame rate, duration, and so on. The footage items you add to a composition become layers, which are manipulated in the defined space and time of the composition, as represented by the Composition and Time Layout windows. You'll not only get an overview of these windows, but also the Time Controls palette.

Though relatively short, this chapter establishes a fundamental process: layering footage in compositions. Nearly all the other chapters are dedicated to the ways you can manipulate those layers.

### Creating Compositions

A composition contains layers of footage, and describes how you arrange them in space and time. This section explains how to create a composition; the following section describes how to choose specific settings that define a composition's spatial and temporal attributes.

#### To create a new composition:

1. Do one of the following things:

Choose Composition > New Composition (Figure 4.1).

**Figure 4.1. Choose Composition > New Composition, or simply press Command-n (Mac) or Ctrl-n (Windows)...**

► Output

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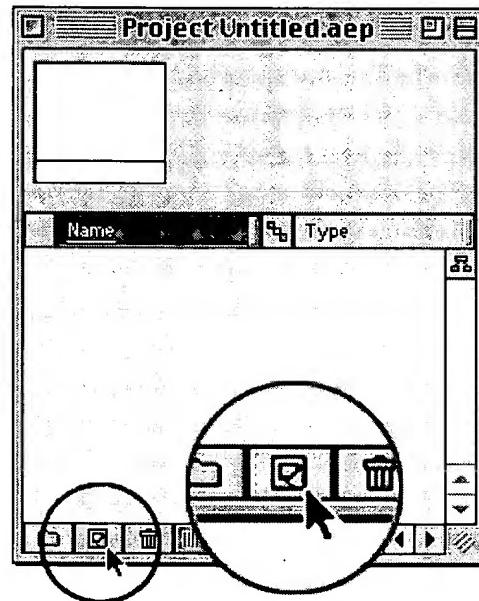
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or

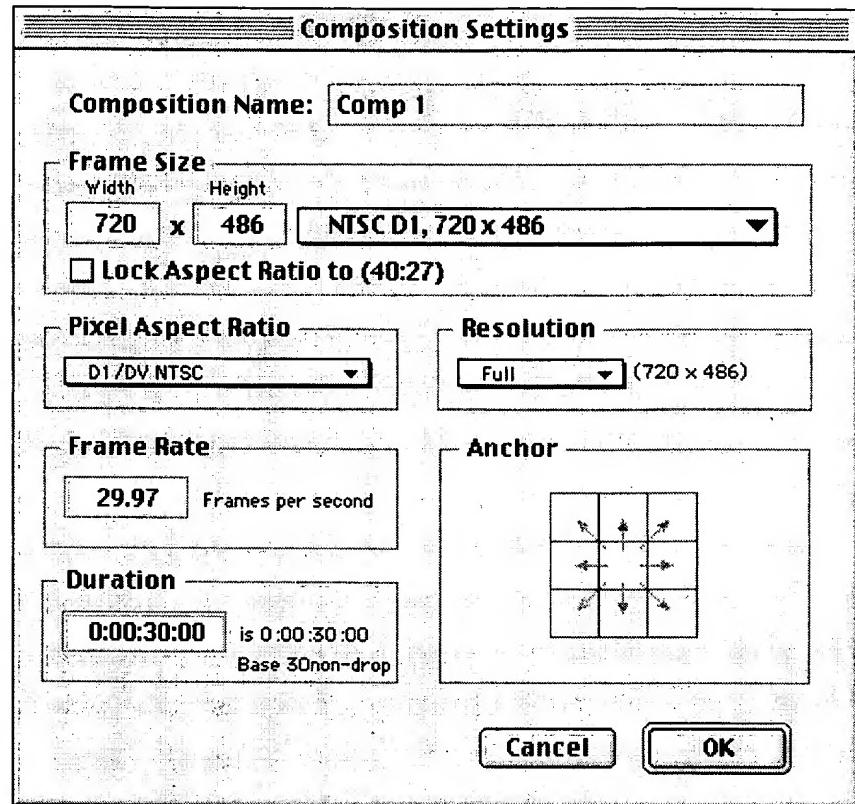
At the bottom of the Project window, click the Composition button (Figure 4.2).

**Figure 4.2. ...or click the Composition button at the bottom of the Project window.**



A Composition Settings dialog box appears (Figure 4.3).

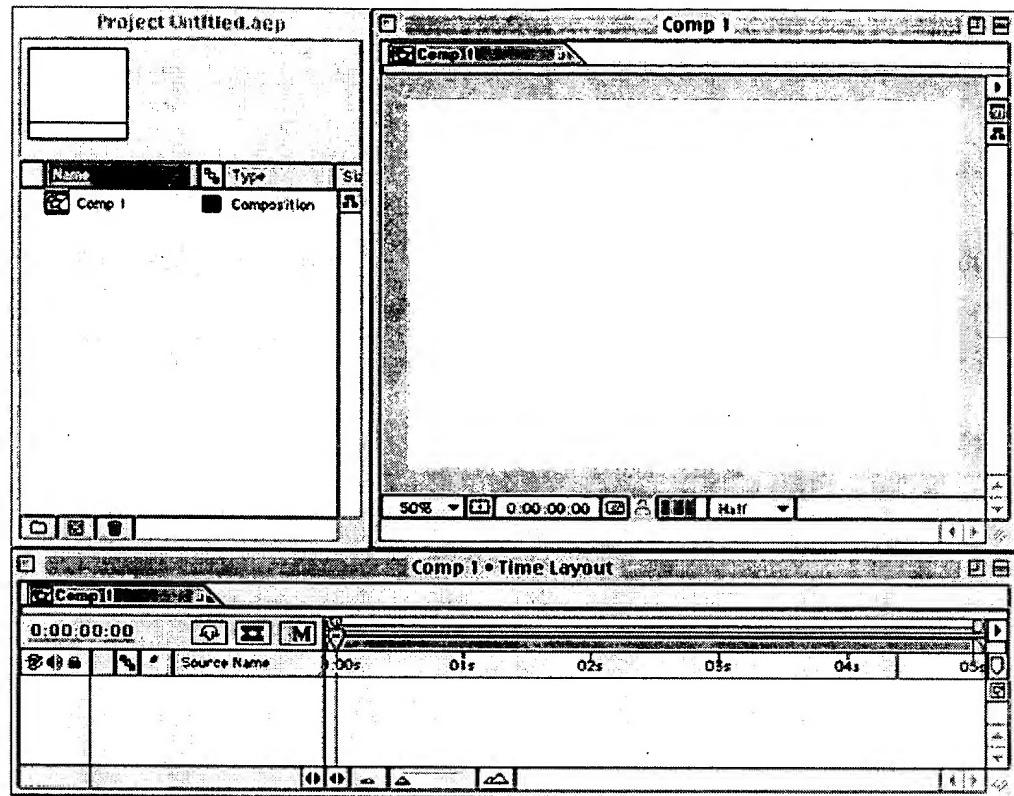
**Figure 4.3. In the Composition Settings dialog box, enter the appropriate settings for the composition.**



2. In the Composition Settings dialog box, choose a name, frame size, pixel aspect ratio, frame rate, duration, and display resolution for the composition. (See "Choosing Composition Settings," later in this chapter for details.)
3. Click OK to close the Composition Settings dialog box.

A new composition appears in the Project window, and a related Composition window and Time Layout window open (Figure 4.4).

**Figure 4.4. A composition appears in a Composition window, Time Layout window, and as an icon in the Project window.**



### Tip

It's easy to forget to name the composition, or simply settle for the default name, Comp 1. Do yourself a favor and give the composition a descriptive name. This will help you stay organized as your project becomes more complex.

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From Visual Quickpro Guide After Effects 7 for Windows and Macintosh by Antony Bolante
- 2. Choosing Composition Settings  
From Visual Quickpro Guide After Effects 7 for Windows and Macintosh by Antony Bolante
- 3. Nesting Compositions  
From Visual Quickpro Guide After Effects 7 for Windows and Macintosh by Antony Bolante

- |   |
|---|
| 4. Workshop 13: Create Advanced Composites<br>From Jerry Hofmann on Final Cut Pro® 4 by Jerry Hofmann                       |
| 5. Compositions<br>From Visual Quickpro Guide After Effects 7 for Windows and Macintosh by Antony Bolante                   |
| 6. Nesting<br>From Visual Quickpro Guide After Effects 7 for Windows and Macintosh by Antony Bolante                        |
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#### Layer Property Types

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### Properties and Keyframes > Layer Property Types

## Chapter 7. Properties and Keyframes

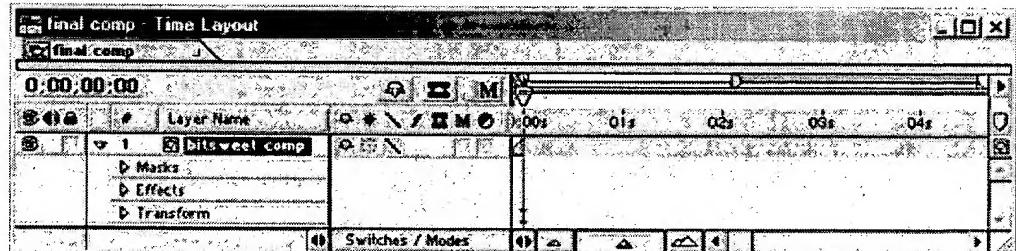
As with all things powerful, After Effects both attracts and repels. Initially, users are drawn to its ability to control precisely the behavior and appearance of layers over time. Upon closer inspection, however, they recoil from a cryptic array of controls that looks more like raw telemetry off the space shuttle than artistic tools.

This chapter fearlessly unveils layer properties and begins to demystify animation. Once you understand how to define properties, you can extend your knowledge to control practically any attribute of any layer in the composition. And when you learn how to use keyframes to animate properties, you'll be ready for future chapters in which you'll gain even greater control over layers. Most of all, you'll begin to realize that it's not as hard as it looks.

## Layer Property Types

A *property* refers to any of a layer's visual or audio characteristics, which can be assigned different values over time. Properties fall into three main categories: masks, effects, and transform (Figure 7.1).

**Figure 7.1. There are three major categories of visual properties: masks, effects, and transform.**



## Masks

You can define one or more masks for each layer in the composition. Like the acetate layers used in traditional compositing, masks allow you to include portions of an image and conceal others. They also allow you to apply effects to selected portions of layers. You can apply one or several masks to a layer, and define the way

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they interact. Not only can you control the shape and feather of a mask, but you can even animate these attributes over time. Chapter 9 describes using masks in detail.

## Effects

Effects include a wide range of options that allow you to modify the sound and images in the composition. Effects allow you to make simple adjustments—such as color correction, or audio filtering—or more pronounced changes, such as distorting and stylizing. *Keying effects* help to composite images, while *transition effects* blend one layer into another. You can even use effects to create visual elements such as text, light, or particles. After Effects includes a variety of built-in effects. You can increase your repertoire of effects with the Production Bundle, as well as third-party plug-ins. Chapter 10 provides a more detailed introduction to using effects.

## Transform Properties

Previous versions of After Effects referred to transform properties as *geometrics*. Though the name has changed, the properties are the same. While you may not choose to apply any masks or effects to the layers of your compositions, you must always define their basic transform properties: position, scale, rotation, and opacity. This chapter focuses on these essential layer properties.

## Audio Properties

Layers containing audio also display an audio property in the layer outline. Audio-only layers can only contain the Effects and Audio property categories. The Audio category simply includes a Levels property to control audio volume, and a waveform display. Though it may sound limited at first, be aware that audio effects furnish you with several other ways to process audio. Along with transform properties, this chapter explains how to set audio levels.

## Properties and Rendering Order

The order in which these categories are listed reflects the order in which After Effects renders them. Starting with the lowest layer in the stacking order, After Effects renders each layer's masks, effects, transform, and audio properties. You don't need to concern yourself with the rendering order at this point. But it does become an important factor as your animations become more complex.

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### Compositions > Choosing Composition Settings

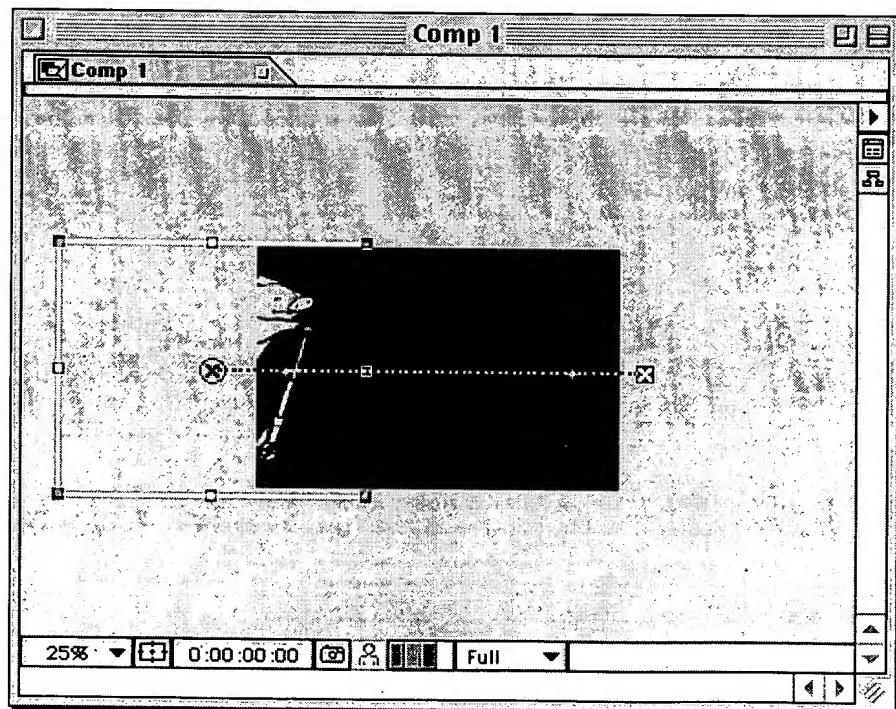
## Choosing Composition Settings

Because compositions describe how layers are arranged in space and time, you must define a composition's spatial attributes, such as its frame size and pixel aspect ratio, as well as its temporal aspects such as its duration and frame rate. Composition settings allow you to specify these characteristics, in addition to the resolution or quality of the display of the Composition window. You may change any of the composition settings at any time.

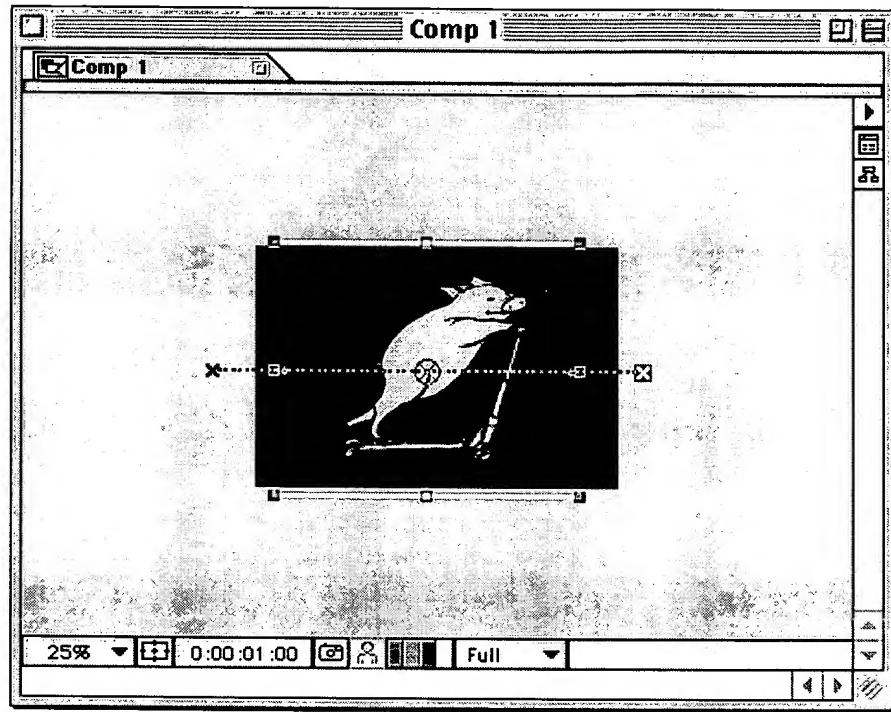
### Frame size

The frame size determines the viewing area of the Composition window. Though you may position images in the workspace outside of this viewing area, only the elements within the visible frame will be rendered for previews and output (Figure 4.5, Figure 4.6 and Figure 4.7).

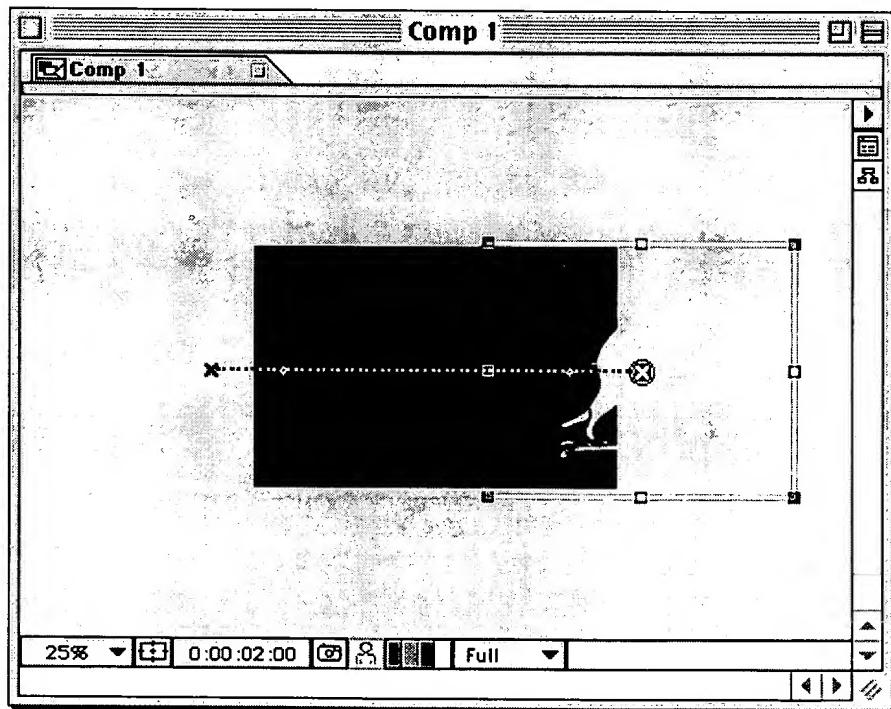
**Figure 4.5. The frame size defines the dimensions of the viewable area of the composition. Over time, an element may move from the "off-screen" work area...**



**Figure 4.6. ... and into the "on-screen" visible frame...**



**Figure 4.7. ... and vice versa. Only elements within the visible frame appear in the final output.**



Often, the frame dimensions of the final output determine the frame size of a composition. But if the composition is to be nested in another composition, the frame size may be larger or smaller than the pixel dimensions of the final output. (See "Nested Compositions," later in this chapter, or Chapter 14.)

The Composition Settings dialog box provides a list of preset frame sizes, or you may enter a custom frame size. The frame size you choose is centered in a work space that is limited to the same maximum dimensions as imported image files. As with imported footage files, chances are you'll run out of available RAM before you exceed the maximum image size (up to 30,000 x 30,000 pixels, depending on the output option). For more about the maximum frame size of images, see the sidebar, "Wham, Bam—Thank You RAM," in Chapter 2.

**To set the frame size:**

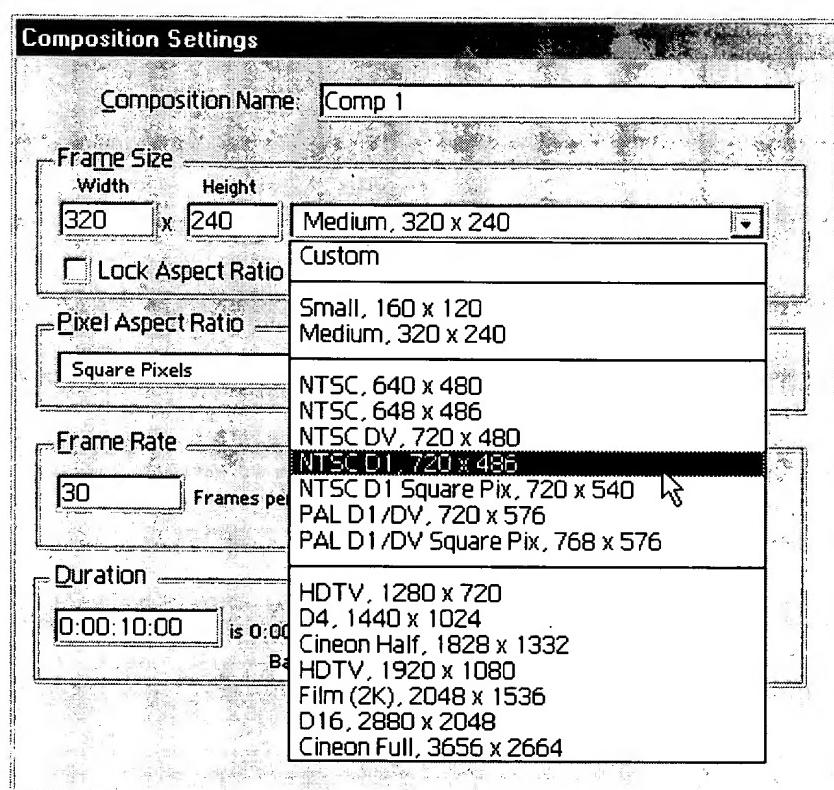
1. In the Composition Settings dialog box, do one of the following things:

Enter the width and height of the frame size in pixels.

or

Choose a preset frame size from the pull-down menu (Figure 4.8).

**Figure 4.8. Enter the frame dimensions, or choose a preset size from the pull-down menu.**



2. If you are changing the frame size of an existing composition, choose an anchor point from the Anchor section of the Composition Settings dialog box.

**Tip**

You can enter a custom frame size that uses the same image aspect ratio of a preset frame size. First, choose a preset frame size that uses the image aspect ratio that you want to maintain. Check the Lock Aspect Ratio To checkbox and enter a custom frame size. When you enter a value for one dimension, After Effects automatically fills in the other, maintaining the same aspect ratio.

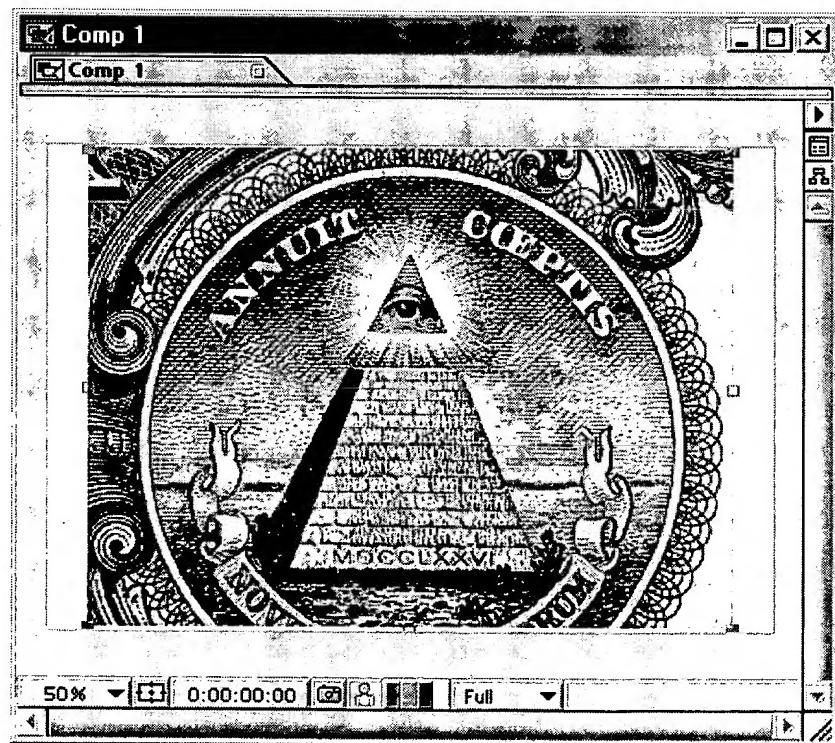
**Pixel Aspect Ratio**

A typical computer monitor uses square pixels to display an image. Professional video, on the other hand, displays images using non-square pixels. As a result, an image created on a computer can appear distorted when transferred to video, and vice versa.

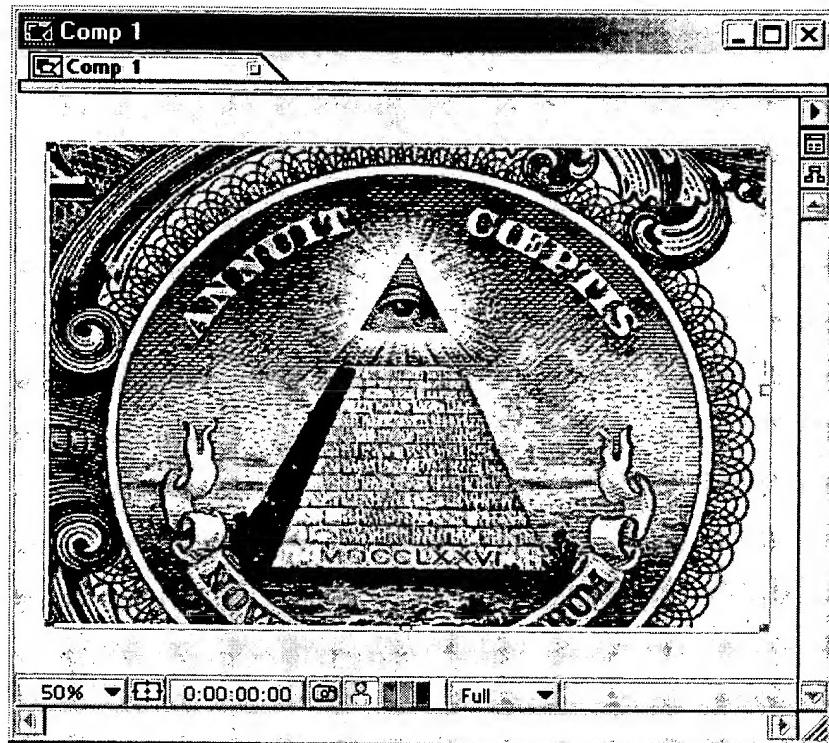
One of After Effects'great advantages is that it can compensate for the differences in pixel aspect ratios. In fact, when you choose a preset frame size, After Effects automatically selects the corresponding pixel aspect ratio, or PAR. If you want to override this setting, or if you enter a custom frame size, you can choose the correct pixel aspect ratio manually.

The PAR of your composition should match the PAR of the final output. After Effects compensates for any difference between the pixel aspect ratio of the composition and individual footage items. For example, if you add a square pixel footage item into a D1 composition, After Effects automatically resizes the image to prevent image distortion in the final output (Figure 4.9 and Figure 4.10).

**Figure 4.9. Incorrectly interpreted as having non-square pixels, this 640 x 480 square pixel image seems to lose its 4:3 aspect ratio in this 720 x 486 (D1/non-square pixels) composition.**



**Figure 4.10. Correctly interpreted as having square pixels, the image is automatically resized to compensate for a composition set to the D1 standard.**

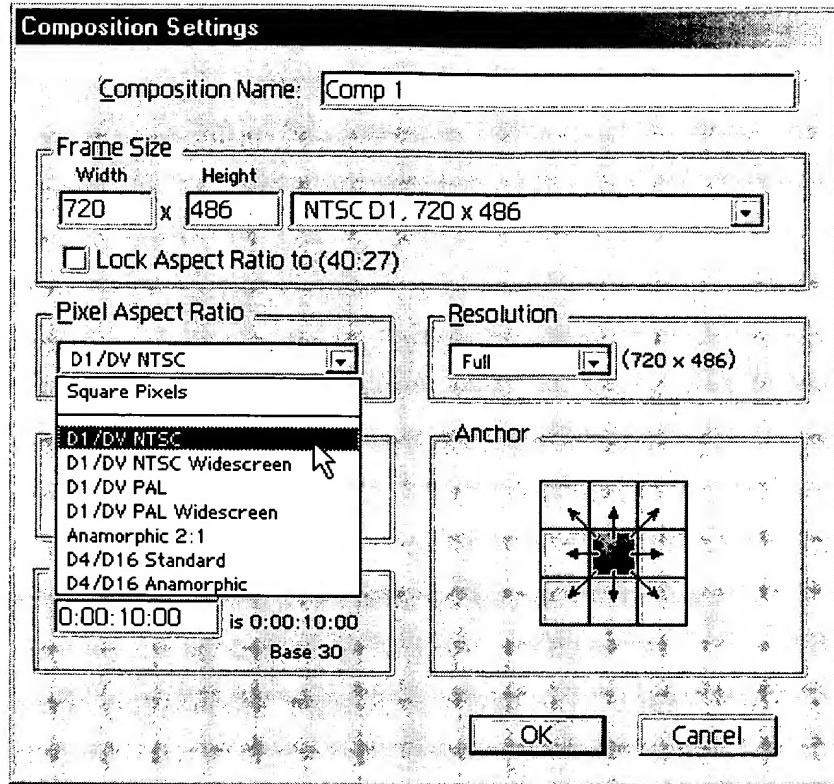


For a detailed explanation of pixel aspect ratio, see the sidebar, "PAR Excellence," in Chapter 2.

**To set the pixel aspect ratio of a composition:**

In the Pixel Aspect Ratio section of the Composition Settings dialog box, choose a PAR from the pull-down menu (Figure 4.11).

**Figure 4.11. In the Pixel Aspect Ratio pull-down menu, choose the pixel aspect ratio that corresponds to your final output.**



### Tip

As suggested above, the most common PARs are "square pixel" and "D1/DV NTSC." Square pixels correspond to formats displayed on computer monitors, or consumer-level video capture cards. D1/DV NTSC corresponds to the non-square pixels used by the professional NTSC video formats (D1, or ITU-R 601) and the DV video standard (mini DV, DVCam, and DVCPro).

## Resolution

Frame size sets the actual pixel dimensions of the composition; resolution determines the fraction of the pixels that are displayed in the Composition window.

By lowering the resolution, you not only reduce the image quality, but also the amount of memory needed to render frames. Rendering speeds increase in proportion to the image quality you sacrifice. In a typical work flow, you work and preview your composition at a lower resolution, and render the final output at full resolution (Figure 4.12 and Figure 4.13).

**Figure 4.12. Typically, you work and preview a composition at a lower resolution (in this case quarter resolution)...**



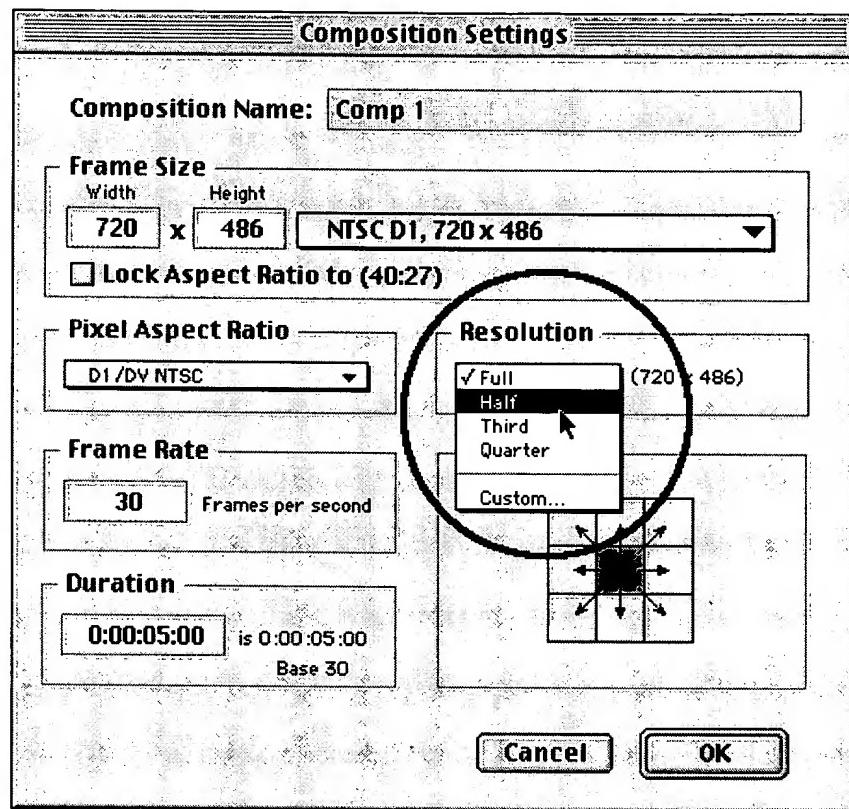
**Figure 4.13. ... then switch to Full resolution when you want to see the image at output quality, or to render the final version.**



**To set the resolution of the composition:**

1. In the Composition Settings dialog box, choose a setting from the Resolution pull-down menu (Figure 4.14):

**Figure 4.14. Choose a resolution from the pull-down menu.**



**Full**— renders and displays every pixel of the composition, resulting in the highest image quality and the longest rendering time.

**Half**— renders every other pixel, or 1/4 of the pixels of the full-resolution image in 1/4 of the time.

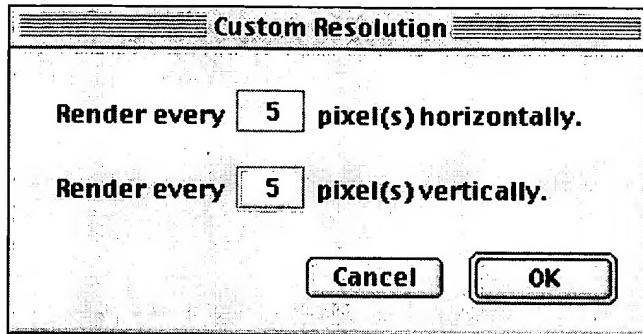
**Third**— renders every third pixel, or 1/9 the pixels of the full-resolution image in 1/9 of the time.

**Quarter**— renders every fourth pixel, or 1/16 the pixels of the full-resolution image in 1/16 of the time.

**Custom**— renders the fraction of pixels you specify

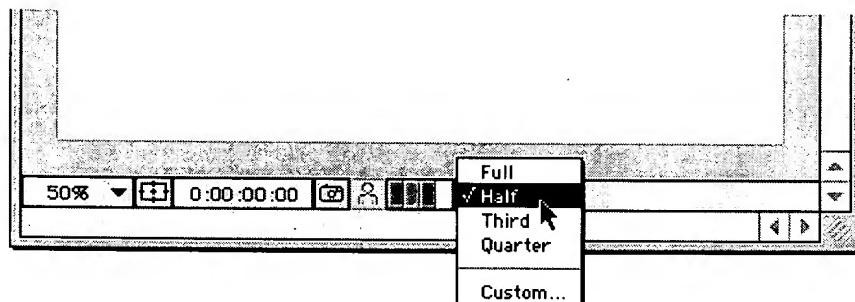
2. If you choose Custom from the pull-down menu, enter values to determine the horizontal and vertical resolution of the image (Figure 4.15).

**Figure 4.15. If you choose custom from the pull-down menu, enter values to determine the resolution manually. Rendering every fifth horizontal and vertical pixel would equal 1/25th the resolution and rendering time.**

**Tip**

You can also change the resolution at any time by using the Resolution pull-down menu of the Composition window (Figure 4.16). See "The Composition Window," later in this chapter.

**Figure 4.16. You can also change the resolution using the pull-down menu at the bottom of the Composition window.**

**Tip**

You can control the quality setting of individual layers, separate from the composition as a whole. See Chapter 5 for more details.

**Frame Rate**

The *frame rate* is the number of frames per second, or fps, used by a composition. Usually, the frame rate you choose matches the frame rate of your output format.

Individual footage items have their own frame rates, which you can interpret. (See "To Interpret the Frame Rate" in Chapter 2). Ideally, the frame rate of the footage and the frame rate of the composition match. If not, After Effects conforms the frame rate of the footage item to that of the composition.

For example, if both the composition frame rate and footage frame rate are 30 fps, then the footage in a layer advances a frame whenever the composition advances a frame. In another scenario, however, the footage might be 10 fps, and the composition, 30 fps. In this case, After Effects distributes one second of footage (10 frames) over one second of the composition (30 frames) by displaying each frame of footage three times. In other words, the composition must advance three frames to display a new frame of the footage layer (Figure

4.17).

**Figure 4.17. The frame rate of a footage item is conformed to the frame rate of the composition. In this case, frames of a 10 fps animation are repeated to play in a 30 fps composition to avoid an apparent change in speed.**







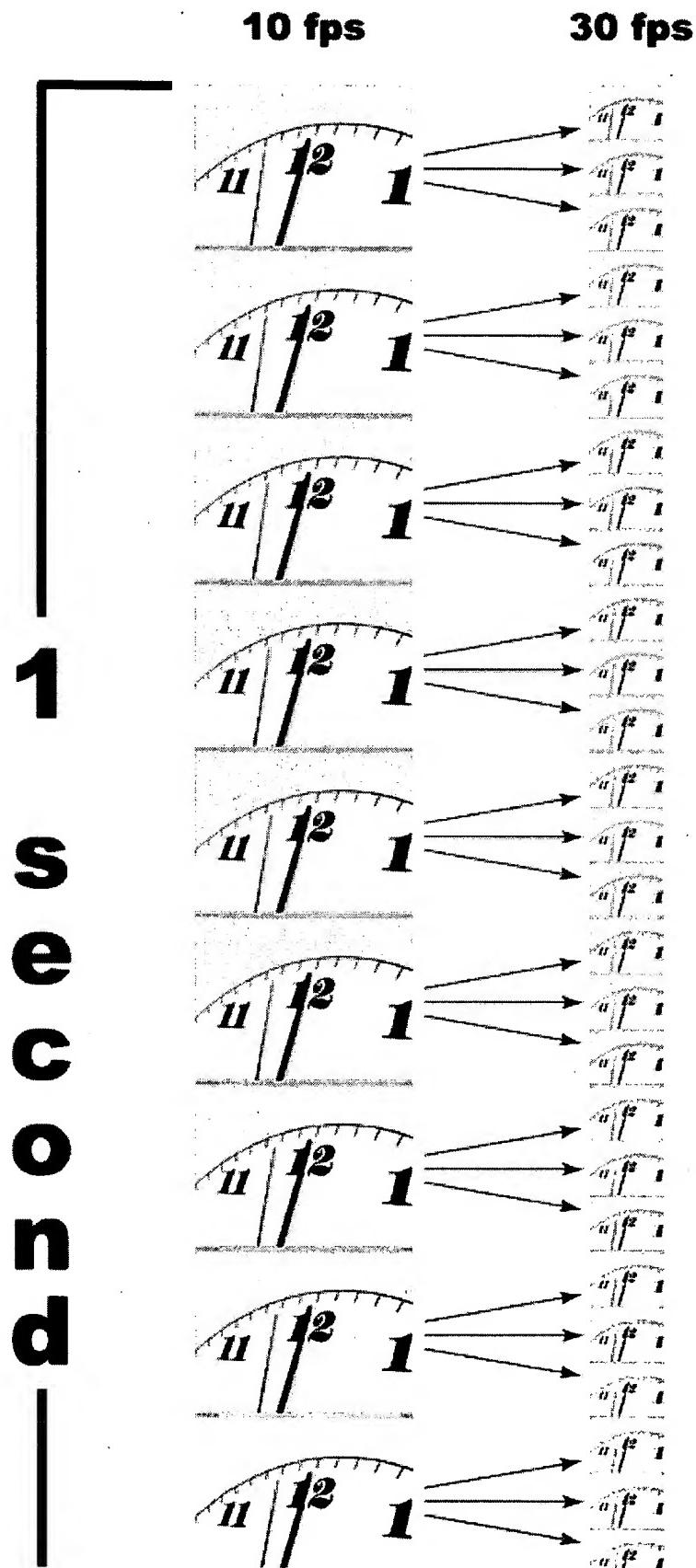








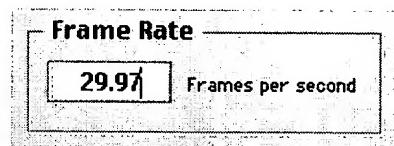




**To set the frame rate of the composition:**

In the Frame Rate section of the Composition Settings dialog box, enter a frame rate (Figure 4.18).

**Figure 4.18. Enter the appropriate frame rate for the composition.**



Usually, you choose a frame rate that matches the frame rate of the output format:

NTSC video—29.97 fps

PAL video—25 fps

Film—24 fps

Computer presentation (often via CD-ROM, or Web)—15 fps or 10 fps. Lower frame rates help to reduce file size and conform to data rate limitations.

**Tip**

Film that has been transferred to video uses video frame rates, and has undergone the process of 3:2 pulldown. For more about 3:2 pulldown, see Chapter 2.

**Tip**

Use the Interpret Footage command to set the proper frame rate for a footage item; set the composition's frame rate according to your output requirements. If you are interested in changing the speed of a layer, see Chapter 6.

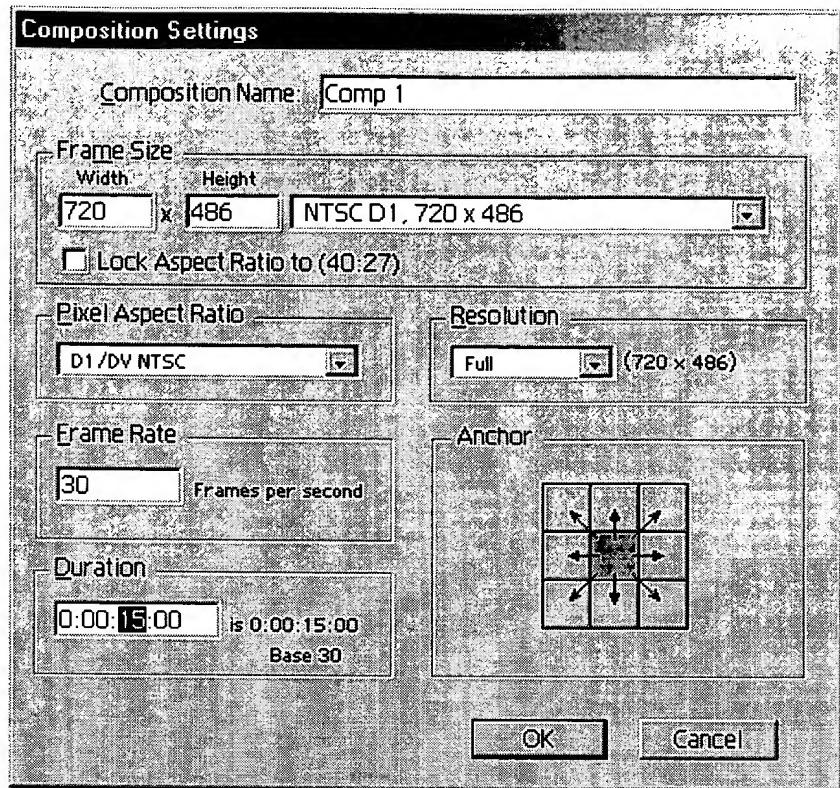
**Duration**

The *duration* sets the length of the composition. The duration is expressed using the time display style you set in the Time panel of the Preferences dialog box (as timecode, frames, or feet and frames).

**To set the duration of a composition:**

In the Duration section of the Composition Settings dialog box, enter the duration of the composition (Figure 4.19).

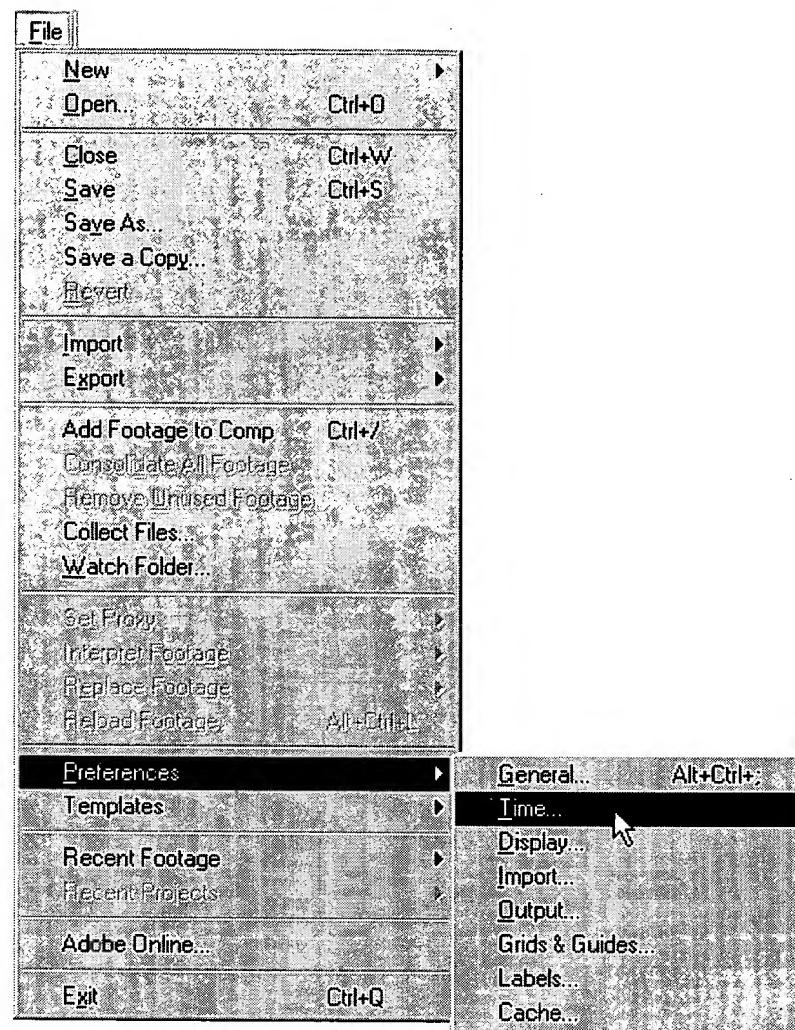
**Figure 4.19. Enter a duration for the composition in the Duration section of the Composition Settings dialog box.**



**To set the time display preferences:**

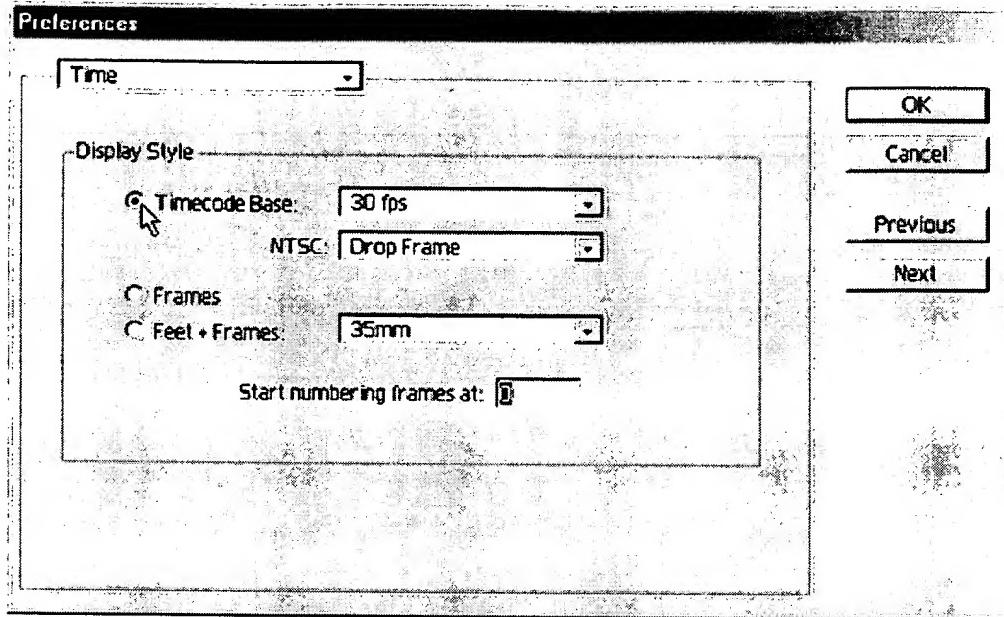
1. Choose File > Preferences > Time (Figure 4.20).

**Figure 4.20. Choose File > Preferences > Time to choose time display options.**



The Time panel of the Preferences dialog box appears (Figure 4.21).

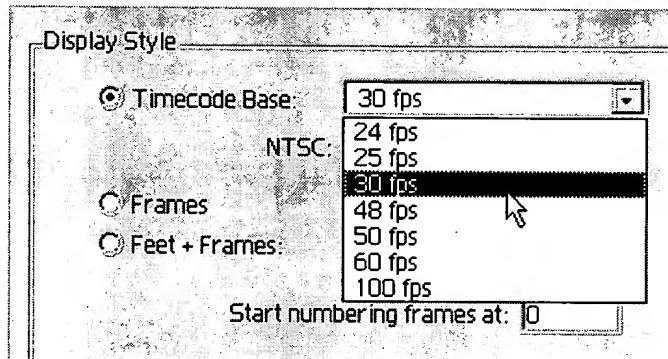
**Figure 4.21. Select a display style in the Time panel of the Preferences dialog box.**



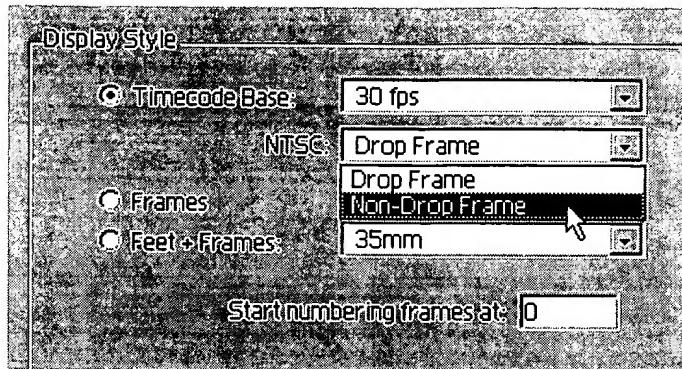
**2.** Choose a display style:

**Timecode Base**— Make a selection from the pull-down menu, and choose the appropriate counting method from the NTSC pull-down menu (Figure 4.22 and Figure 4.23).

**Figure 4.22. If you choose Timecode Base, select a time base and counting method.**

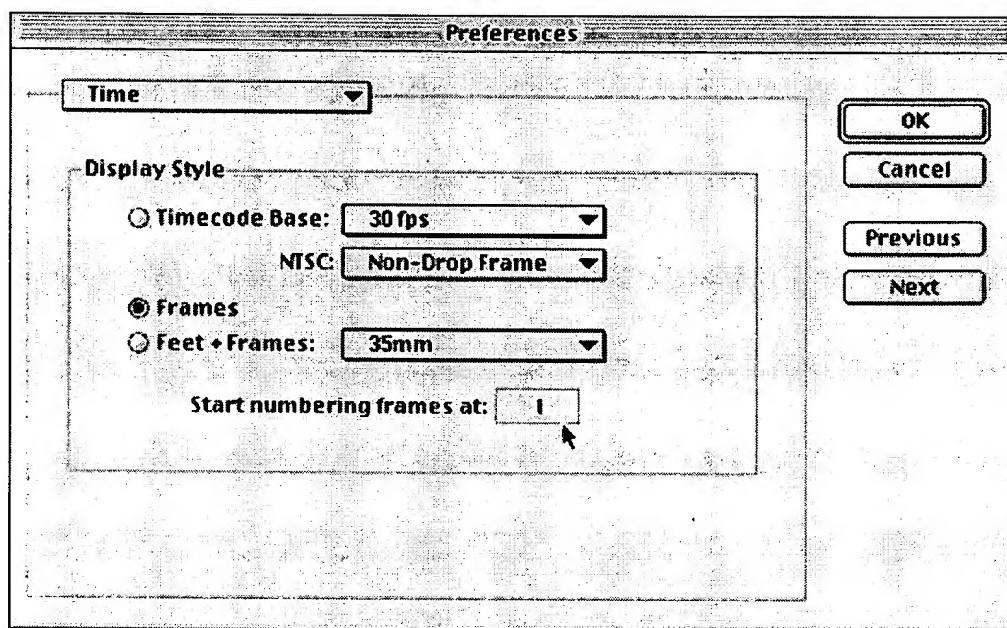


**Figure 4.23. Choose a counting method, either Drop-Frame timecode, or Non-Drop Frame timecode.**



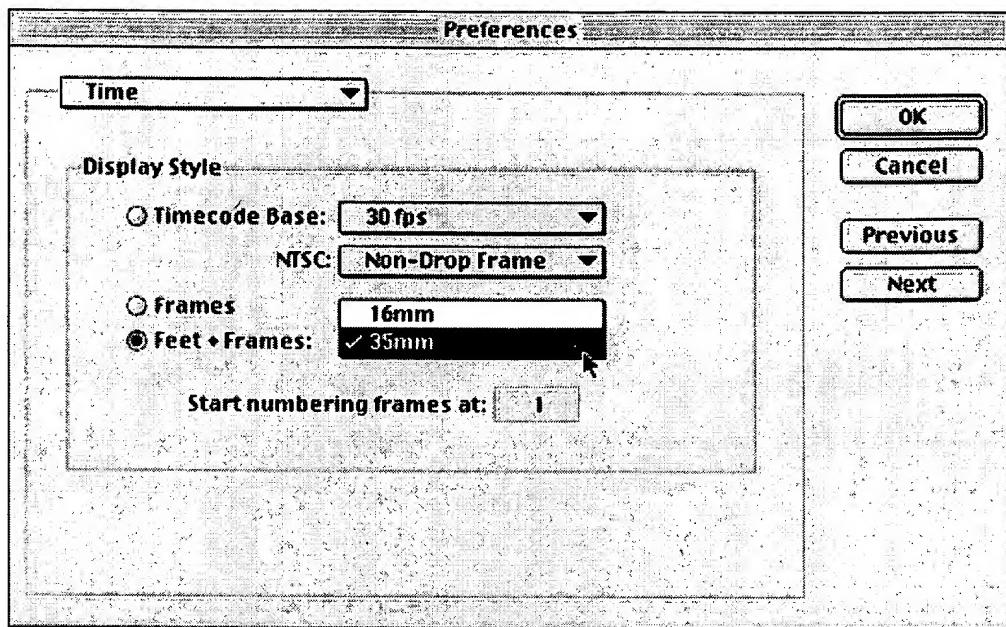
**Frames**— Enter a starting number in the Start Numbering Frames At field (Figure 4.24).

**Figure 4.24. If you choose Frames, enter a starting number.**



**Feet + Frames**— Choose a film format from the pull-down menu (Figure 4.25).

**Figure 4.25. If you choose Feet and Frames, select the appropriate film format from the pull-down menu.**



3. Click OK to close the Preferences dialog box.

### Counting Time—Non-Drop Frame vs. Drop Frame Timecode

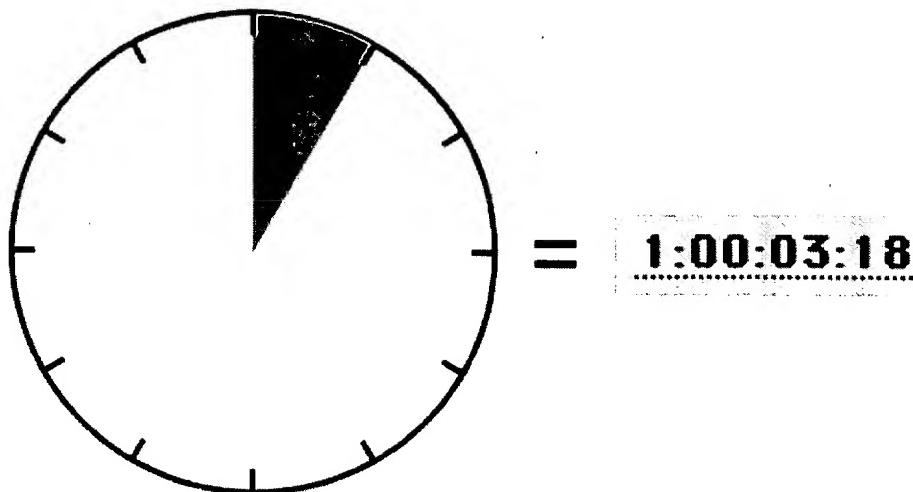
Timecode is a method of counting video frames, developed by the Society of Motion Picture and Television Engineers, or SMPTE. SMPTE timecode is counted in hours, minutes, seconds, and frames. Timecode counts up to just under one day —23:59:59:29.

Because the true frame rate of NTSC video is always 29.97 fps, measuring time accurately in hours, minutes, seconds, and frames can get complicated. To simplify matters, SMPTE timecode rounds off the decimal, and counts at an even 30 fps. However, it can use one of two different counting schemes: Non-Drop Frame or Drop-Frame timecode.

#### Non-Drop Frame Timecode

Even though the true frame rate of NTSC video is 29.97 fps, Non-Drop Frame (NDF) timecode simply counts 30 fps. Over time, however, the discrepancy results in a small but significant difference between the duration indicated by the timecode display and the actual elapsed time (Figure 4.26). Nevertheless, NDF is easy to understand and calculate, so camera originals and other source tapes usually use NDF timecode. Video equipment typically displays NDF timecode with colons between the hours, minutes, seconds, and frames.

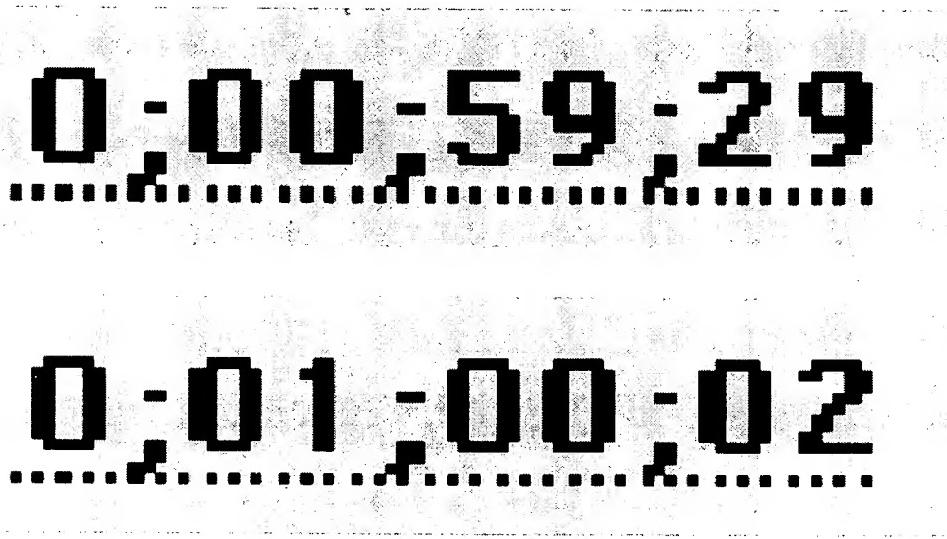
**Figure 4.26. For every hour of real time that elapses, non-drop frame timecode counts an additional 3 seconds and 18 frames.**



#### Drop-Frame Timecode

To compensate for the discrepancy caused by the 30-fps counting scheme, SMPTE developed drop-frame (DF) timecode. Drop-frame timecode also counts 30 fps, but it skips two frame numbers—not actual frames—at the end of every minute, except for every tenth minute (Figure 4.27).

**Figure 4.27. To accurately reflect actual elapsed time, DF timecode skips two frame numbers at the end of every minute, except for every tenth minute.**



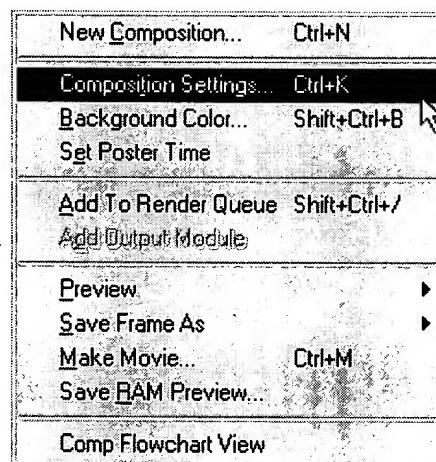
If you do the math, you'll find that DF timecode displays durations that very closely match the actual elapsed time. For this reason, master tapes usually use DF timecode. (Of course, the missing numbers also make it very difficult to do timecode calculations manually.) After Effects and other video equipment display drop-frame timecode semicolons between the hours,

minutes, seconds, and frames.

**To change the settings for an existing composition:**

1. Select a composition in the Project window, or by clicking its tab in the Composition or Time Layout window.
2. Choose Composition > Composition Settings or press Command-k (Mac) or Ctrl-k (Windows) (Figure 4.28).

**Figure 4.28. You can change a composition's settings at any time by choosing Composition > Composition Settings, or by simply pressing Command-k (Mac) or Ctrl-k (Windows).**



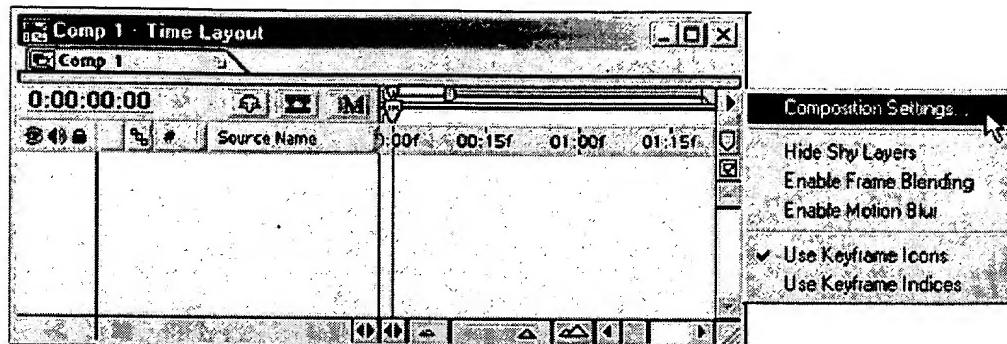
The Composition Settings dialog box appears.

3. Enter new settings for the composition (as described in the previous sections).
4. Click OK to close the Composition Settings dialog box.

**Tip**

You can also access the composition settings from the pop-up menu of the Time Layout window. But using the keyboard shortcut—Command-k (Mac) or Ctrl-k (Windows)—is the quickest way (Figure 4.29).

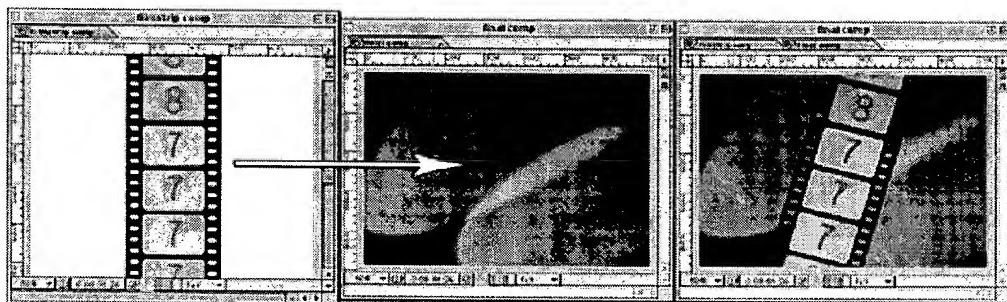
**Figure 4.29. The Time Layout window's menu also gains access to the composition settings. A fine option if you love the mouse, or your keyboard is missing the "k".**



## Background Color

The default background color of a composition is black, but you can make the background any color you want. Whatever the color, the background becomes the alpha channel if you output the composition as a still image sequence or movie with an alpha channel. Similarly, if you use the composition as a layer in another composition, the background of the nested composition becomes transparent (Figure 4.30). See "Nesting Compositions," later in this chapter.

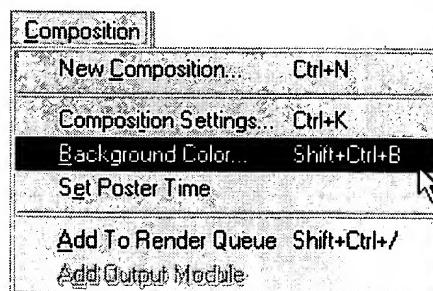
**Figure 4.30. The background of a nested composition becomes transparent.**



### To choose a background color for the composition:

1. Choose Composition > Background Color (Figure 4.31).

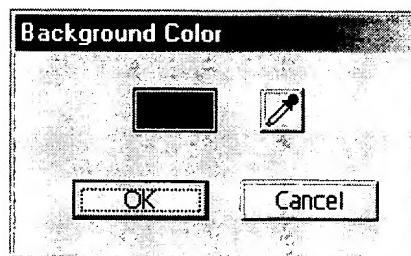
**Figure 4.31. Choose Composition > Background Color.**



A background color dialog box appears.

2. In the Background Color dialog box, do one of the following (Figure 4.32):

**Figure 4.32. Click the eyedropper to pick a screen color, or click the swatch to open a color picker.**



Click the color swatch to open the color picker.

or

Click the eyedropper to choose a color from another window.

3. Click OK to close the Background Color dialog box.

#### Tip

If you need an opaque background—in a nested composition, for example—create a solid layer, as described in "To create a solid color layer," later in this chapter.

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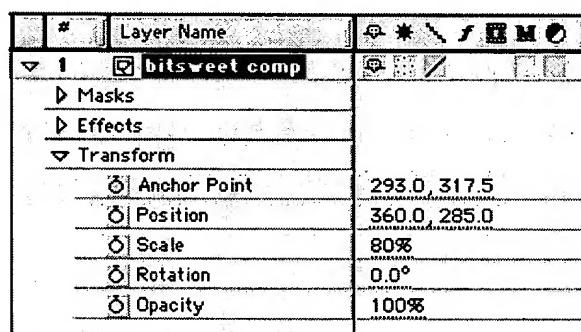


### Properties and Keyframes > Transform Properties

## Transform Properties

Although a layer might not use masks or effects, its transform properties—anchor point, position, scale, and opacity—are fundamental (Figure 7.9). When you create the layer, you actively set the position, either by dragging to the Time Layout or Composition icon to center it, or to the Composition window to place it manually. The other transform properties have a default initial value. The following sections describe each transform property and how to change its value.

**Figure 7.9. Although a layer might not use masks or effects, each of its transform properties have a value—either by default or as you choose to set them.**



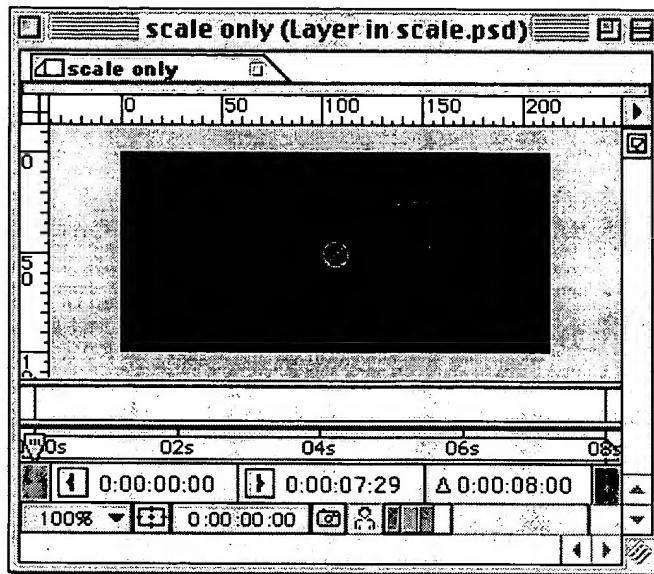
Though the following sections concentrate on transform properties, the techniques for setting values are similar for all types of layer properties.

### Anchor Point

After Effects calculates the position, scale, and rotation of a layer by its anchor point. In other words, the anchor point defines the position of a layer, the point around which a layer is scaled, and the pivot point of the layer's rotation.

By default, a layer's anchor point is positioned in the center of the layer (Figure 7.10). You can move the anchor point by using controls in the Layer window, or by using the Pan Behind tool in the Composition window.

**Figure 7.10. By default, the anchor point is located at the center of a layer. After Effects uses the anchor point to calculate position, rotation, and scale.**



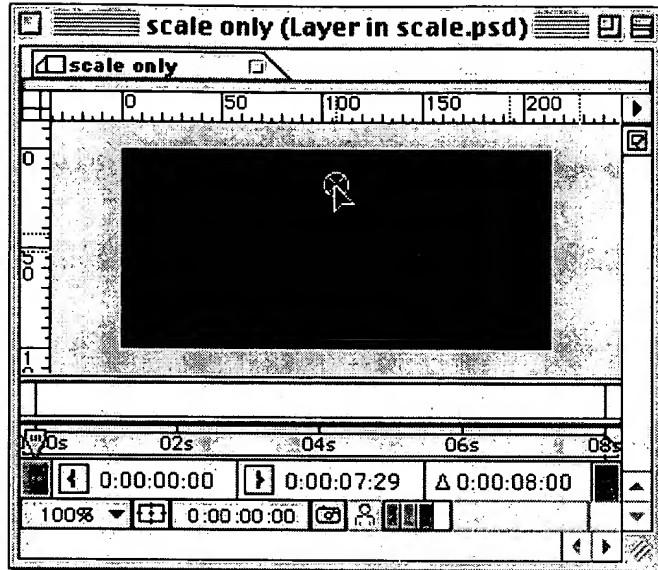
When you change the anchor point in the Layer window, it may appear as though you also changed the layer's position in the Composition window. Actually, the position property of the layer remains the same. By changing the anchor point, you simply change the spot in the layer that determines its position in the composition. Change the anchor point in the Layer window if you haven't already positioned the layer relative to other layers, or if you prefer to manipulate the layer in its own window.

If you want to change a layer's anchor point without disturbing its place in the composition, use the Pan Behind tool. Dragging the anchor point with the Pan Behind tool recalculates the layer's position at the same time. This way, the layer maintains its relative position in the composition.

**To change the anchor point in the Layer window:**

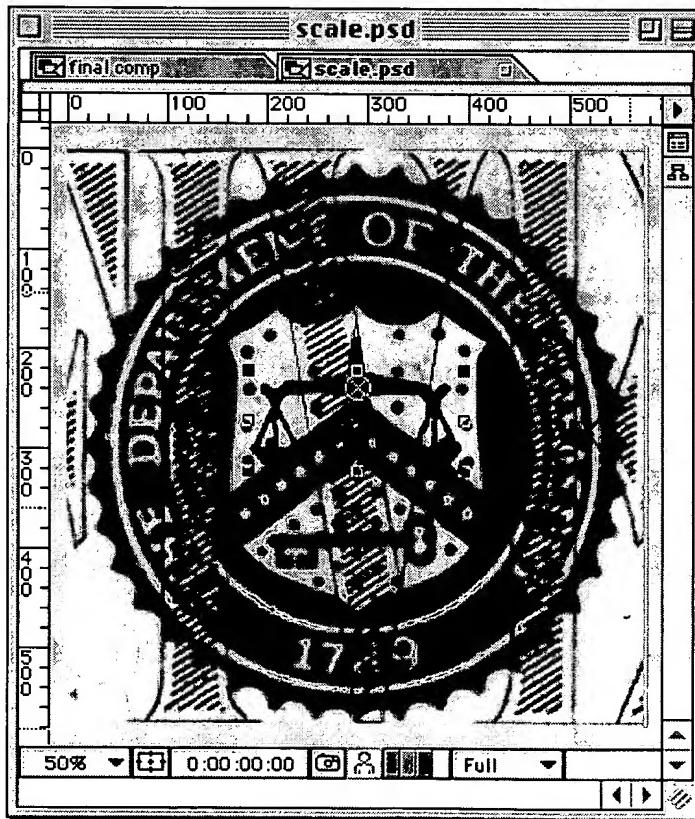
1. In the Time Layout window or Composition window, double-click a layer to open a Layer window.  
A Layer window appears.
2. In the Layer window menu, make sure Anchor Point Paths is checked.
3. In the image area of the Layer window, drag the anchor point to the position you want (Figure 7.11).

**Figure 7.11. When you move an anchor point in a Layer window, it maintains its position in the Composition window.**



Because the anchor point maintains its position in the Composition window, the image in the Composition window moves relative to the anchor point in the Layer window (Figure 7.12).

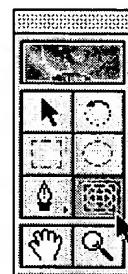
**Figure 7.12. As a result, the image in the Composition window moves, though its actual position values haven't changed. The scales image has moved down as the anchor point has been moved up.**



**To change the anchor point without moving the layer in the composition:**

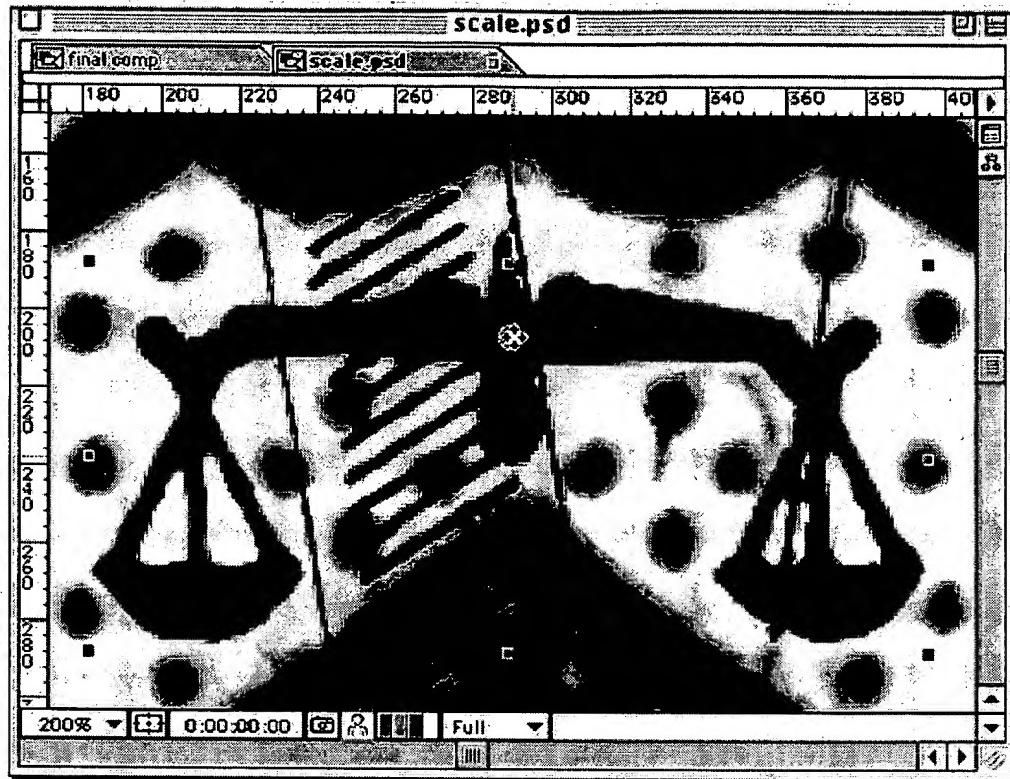
1. Select a layer in the composition.
  2. In the Tools palette, select the Pan Behind tool (Figure 7.13).

**Figure 7.13.** To move the anchor point without disturbing the arrangement of the layers, select the Pan Behind tool.



3. In the Composition window, drag the anchor point to a new position (Figure 7.14). (Make sure to drag the anchor point, not the layer itself.)

**Figure 7.14.** Using the Pan Behind tool recalculates the layer's position as you move the anchor point in the Composition window. This moves the anchor point without disturbing the layer's placement.



The anchor point and position values for the layer change, so that the layer maintains its relative position in the Composition window.

#### Tip

You can use the Pan Behind tool to change a layer's position relative to its mask. See Chapter 12 for more information.

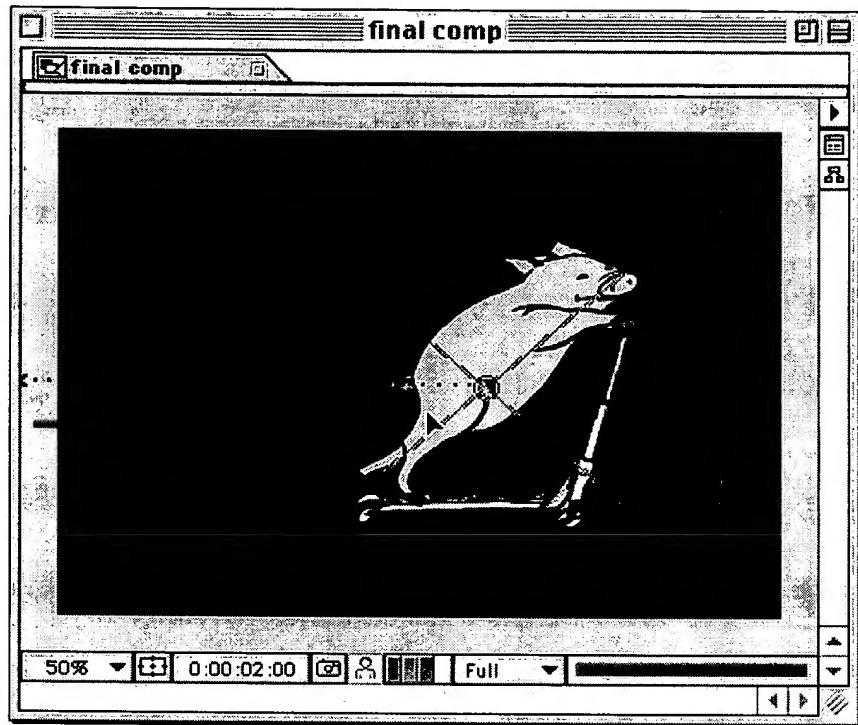
## Position

Setting the position of a layer places its anchor point in the two-dimensional space of the composition. The exact position of a layer is expressed in X, Y coordinates, where the top-left corner of the composition is 0,0. (Moving the zero point of the rulers does not change the coordinate system.) Of course, you can position a layer inside or outside the visible area of the composition.

#### To change a layer's position in the Composition window:

1. Select a layer in the Composition or Time Layout window.
2. In the Composition window, drag the layer to the position you want (Figure 7.15).

**Figure 7.15. You can simply drag selected layers to a new position.**



To move a layer off screen, drag it to the work space outside of the visible area of the Composition window.

The layer is placed at the position you chose. If the stopwatch icon is not active for the layer, this is the position of the layer for its entire duration. If the stopwatch is active, a position keyframe is created at this frame.

**Tip**

As you recall from Chapter 4, dragging the footage item to the Time Layout window or Composition icon in the Project window centers the layer automatically.

**Tip**

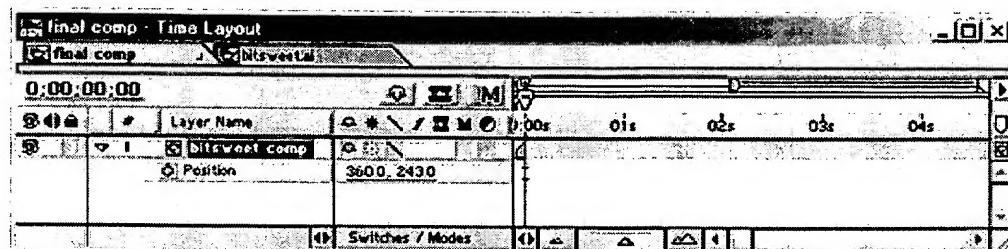
Use the info window to view the exact X and Y coordinates of the layer as you move it. If you set a custom zero point for the rulers, look at the X1 and Y1 display to see the coordinates in terms of the rulers you set.

**To change a layer's position numerically:**

1. Select the layer you want to reposition.
2. Press P to display the position property for the layer.

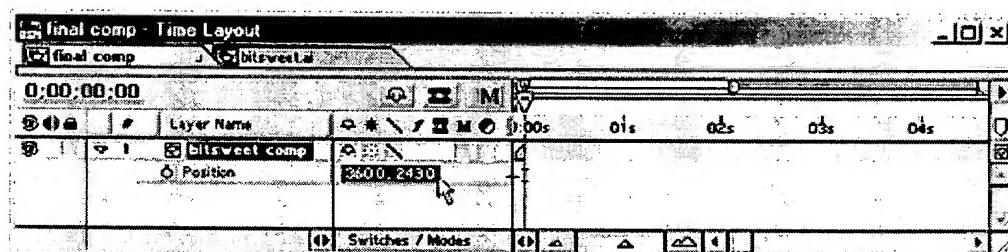
The position property for the layer becomes visible (Figure 7.16).

**Figure 7.16. Select a layer and press P to reveal the position property.**



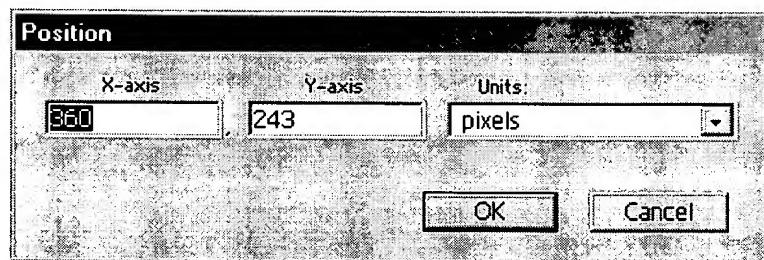
3. Click the Position display in the Switches/Modes panel of the Time Layout window (Figure 7.17).

**Figure 7.17. Click the Position value display to open a Position dialog box.**



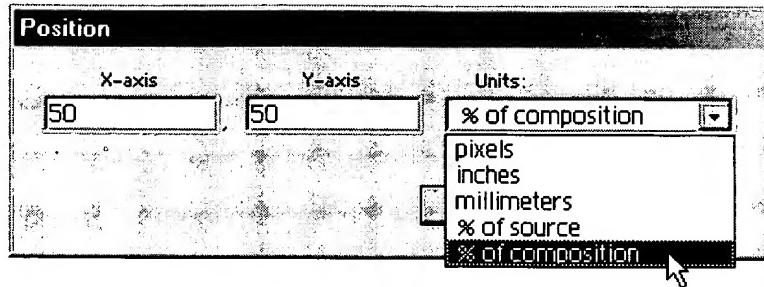
A Position dialog box opens (Figure 7.18).

**Figure 7.18. A Position dialog box opens.**



4. In the Units pull-down menu of the Position dialog box, choose a unit to express X- and Y-axis values (Figure 7.19).

**Figure 7.19. In the Position dialog box, choose a unit to express X- and Y-axis values.**



5. In the Position dialog box, enter a value for the X-axis and Y-axis, using the units you selected in step 4.
6. Click OK to close the dialog box.

The layer is placed at the position you chose. If the stopwatch icon is not active for the layer, this is the position of the layer for its entire duration. If the stopwatch is active, a position keyframe is created at this frame.

### **Subpixel Positioning and Resampling**

When you set a layer to draft quality, After Effects calculates position, rotation, and scale (or any effect that moves the pixels of an image) by using whole pixels. When layers are set to best quality, however, these values are calculated to the thousandth of a pixel, or on a *subpixel* basis. The more you zoom into the Composition window, the greater precision with which you can move a layer. Audio/video editors might compare this to the ability to cut an audio track to the audio sample rate, rather than the much less precise video playback rate.

Because subpixel positioning allows layers to move with a precision greater than the resolution of the composition, movement appears much smoother than when you're not using subpixel positioning. You can see the difference by contrasting the movement of layers set to draft quality to the same movement set to best quality.

Subpixel positioning also requires more precise calculations, so it takes After Effects longer to render images. In order to work more quickly, you may want to do much of your work in draft quality, and switch to best quality when you fine-tune.

Although subpixel positioning results in smoother motion, it can introduce unwanted softening of still images. When After Effects uses subpixel positioning, it *resamples* the image, calculating how to distribute the pixels of the image unevenly within the composition. The edges of an image that has been resampled appear softer than one that hasn't been resampled.

You can avoid the effects of resampling by ensuring that the difference between a layer's anchor point and position is a whole integer. Subpixel positioning and resampling occur only when the difference between a layer's anchor point value and its position value is a fraction.

Because the default value of an anchor point is at the center of a layer, the easiest way to avoid resampling is to save bitmapped images (such as Adobe Photoshop files) at even pixel dimensions for use in compositions with even pixel dimensions.

For example, a 400 x 400 image's default anchor point values are (200, 200). If you centered the layer in a 640 x 480 composition, its anchor point would be at (320, 240). Because the

difference between the anchor point values (200, 200) and the position values (320, 240) are whole integers, no resampling occurs. On the other hand, centering a (425 x 425) image in the same composition would place its anchor point at (212.5, 212.5): Because the difference between (212.5, 212.5) and (320, 240) is a fraction, the image is resampled.

Because vector graphics (such as Illustrator files) don't use pixels until they are rasterized, they are more difficult to prepare and guard against resampling. For path-based graphics, the crop marks or bounding box determines the pixel dimensions of the image. You may also determine its dimensions by manually creating a bounding box without a stroke or fill to contain the graphics. Experiment to create an Illustrator template with crop marks that will rasterize as a layer with even pixel dimensions. Oddly enough, an **odd** size in Illustrator usually translates into an even size in After Effects. What's more, the results can be inconsistent. Try creating 8.89" x 6.65" crop marks in Illustrator to create a 640 x 480 layer in After Effects.

Of course, using even pixel dimensions only avoids resampling when the composition also uses even dimensions, and if you don't manually set the anchor point or position to a fractional value. Remember: you can drag a layer on a subpixel basis when its quality is set to best and the magnification of the Composition window is 200% or more. Don't inadvertently nudge the layer into being resampled.

If you can't prepare or edit the layer's pixel dimensions, you can still change its anchor point or position so that the difference between the two is a whole integer. If necessary, zoom into the composition 200% and nudge the layer 1/2 pixel in the appropriate direction (see "Nudging Layer Properties," later in the chapter). Alternatively, you can change the anchor point numerically (as explained in the previous section) by 1/2 pixel.

## Scale

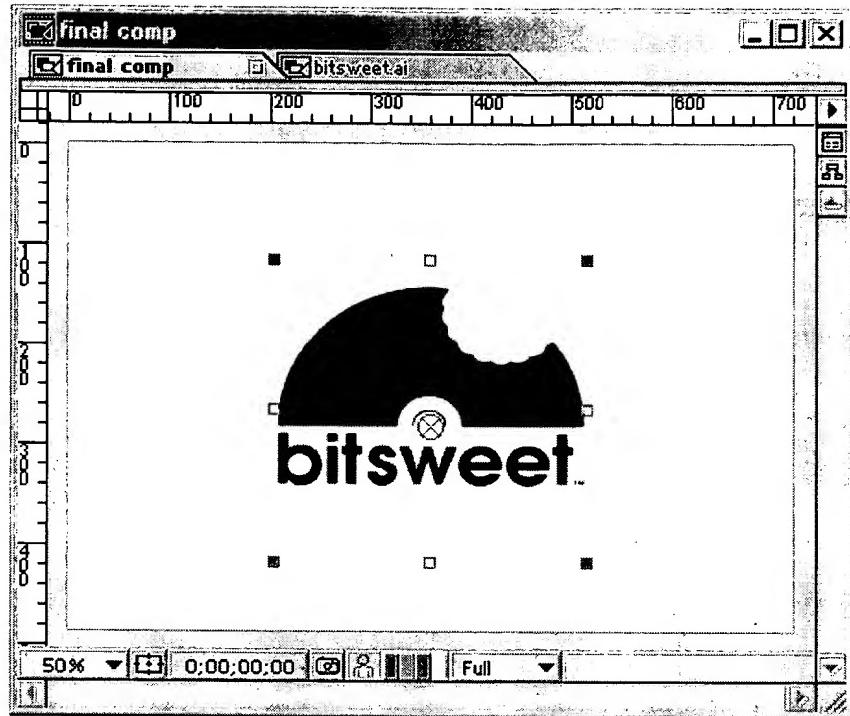
By default, a layer is set to 100% of its original size, or scale. You scale a layer around its anchor point. In other words, the anchor point serves as the mathematical center of a change in size. When you scale a layer by dragging, you'll notice how the handles of the layer seem to stretch from the anchor point.

Remember that bitmapped images look blocky and pixelated when scaled much more than 100%. When you scale path-based images beyond 100%, the Continuously Rasterize switch can help you maintain its image quality. Review Chapter 2 for more about image size and rasterization.

### To scale a layer by dragging:

1. Select a layer and make sure its layer handles are visible in the Composition window (see, "Viewing Spatial Controls in the Composition Window," earlier in this chapter) (Figure 7.20).

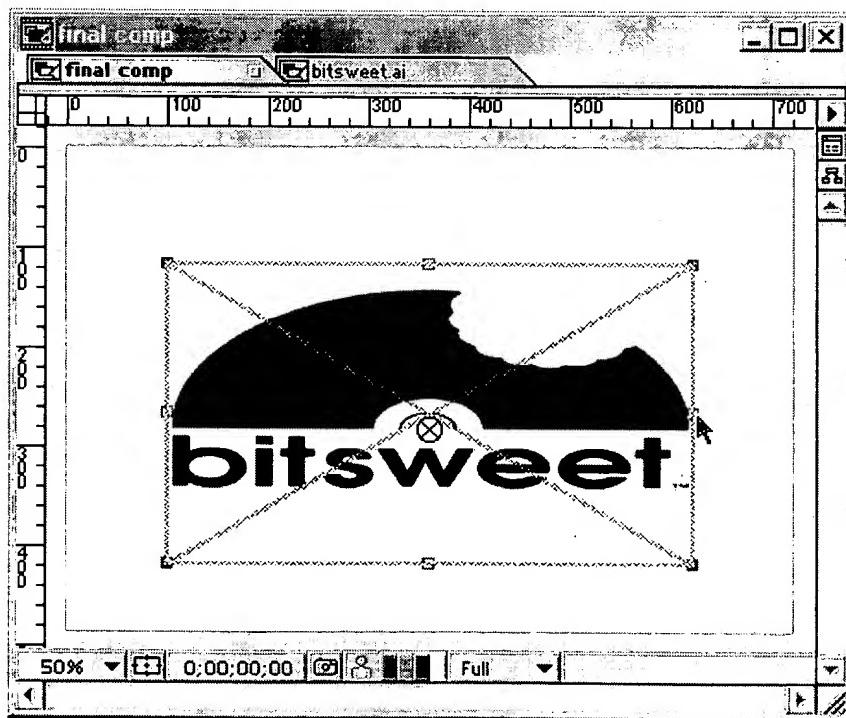
**Figure 7.20. A selected layer's handles can be dragged to scale it...**



2. In the Composition window, do any of the following things:

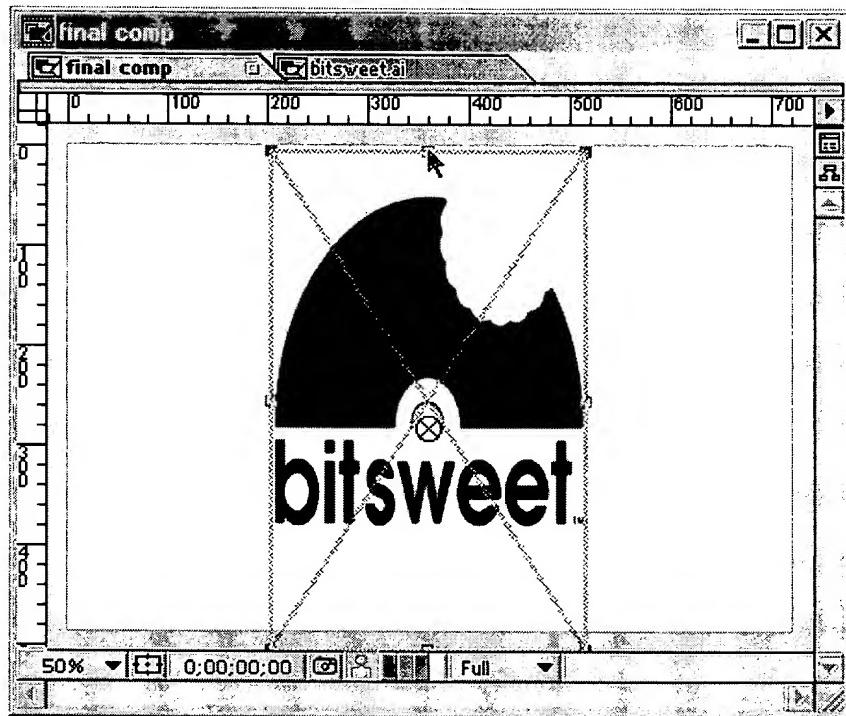
To scale the layer horizontally only, drag the center left or center right handle (Figure 7.21).

**Figure 7.21. ...horizontally...**



To scale the layer vertically only, drag the center bottom or the center top handle (Figure 7.22).

**Figure 7.22. ... vertically...**



To scale the layer horizontally and vertically, drag a corner handle.

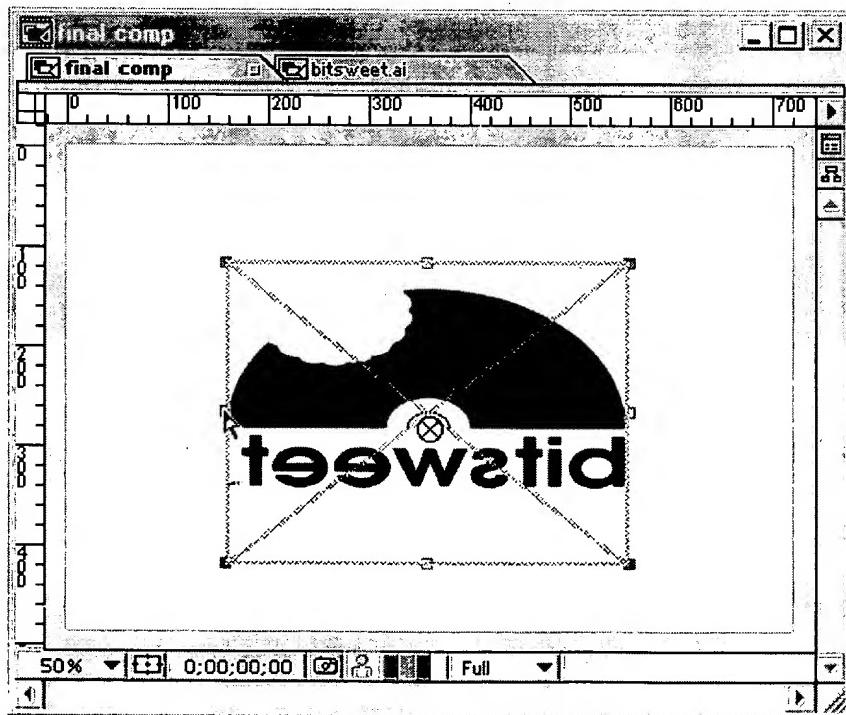
To scale the layer while maintaining its proportions, press Shift as you drag a corner handle (Figure 7.23).

**Figure 7.23. ... or both aspects. Shift-drag a corner handle to scale the layer while maintaining its proportions.**



To flip a layer, drag one side of the layer's bounding box past the other side (Figure 7.24).

**Figure 7.24. You can flip a layer by dragging one side past the other.**



**3. Release the mouse.**

In the Composition window, the layer appears with the scale you set. If the stopwatch icon is not active for the layer, this is the scale of the layer for its duration. If the stopwatch is active, a scale keyframe is created at this frame.

**Tip**

You can scale a layer without dragging handles by pressing Command (Mac) or Ctrl (Windows) while dragging a layer.

**Tip**

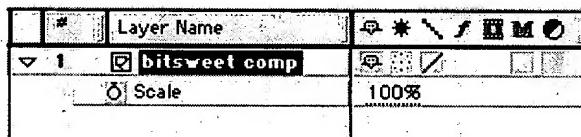
You can quickly reset the scale of a layer to 100% by selecting the layer and double-clicking the selection tool.

**To scale a layer numerically:**

1. In the Time Layout window, select a layer you want to scale.
2. Press S to display the layer's scale property.

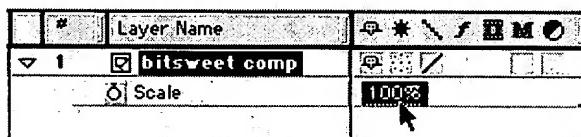
The scale property appears for the selected layer (Figure 7.25).

**Figure 7.25. Select a layer and press S to reveal the scale property.**



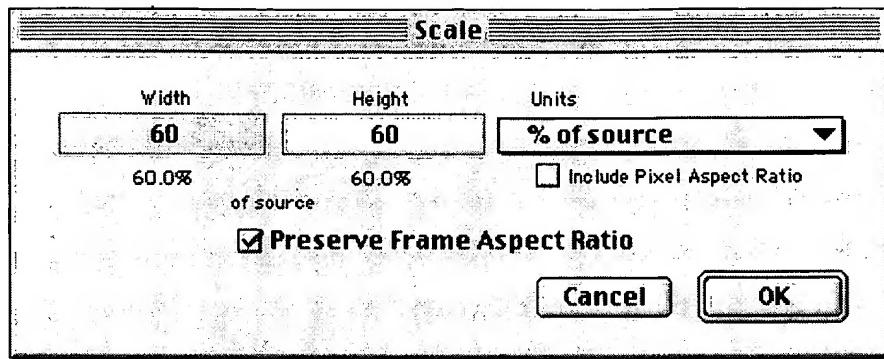
3. Click the Scale display in the Switches/ Modes panel of the Time Layout window (Figure 7.26).

**Figure 7.26. Click the scale value display to open the Scale dialog box.**



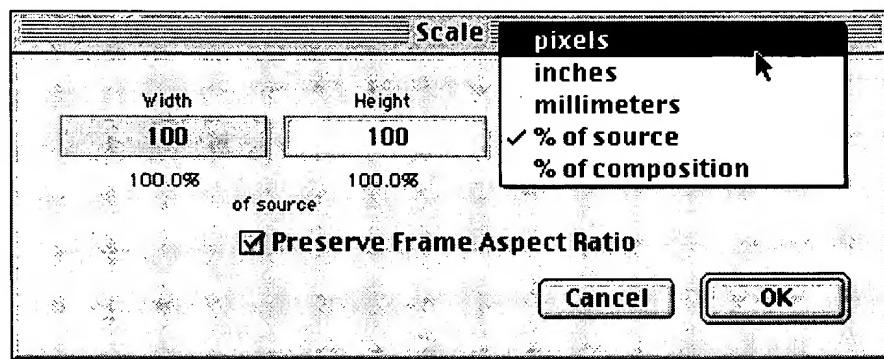
The Scale dialog box appears (Figure 7.27).

**Figure 7.27. A Scale dialog box appears.**



- In the Units pull-down menu in the Scale dialog box, choose a unit of measure for the width and height values (Figure 7.28).

**Figure 7.28. In the Scale dialog box, choose a unit of measure.**



- For width and height, enter values based on the units you chose in step 4.

To flip a layer horizontally, enter a negative value for width; to flip a layer vertically, enter a negative value for height.

- To constrain the width and height values to maintain the aspect ratio of the source, check Preserve Frame Aspect Ratio.
- If the layer uses a different pixel aspect ratio (PAR) than the composition, do one of the following:

Check Include Pixel Aspect Ratio to adjust the scale values automatically to compensate for the difference between PARs.

Uncheck Include Pixel Aspect Ratio to scale the layer without compensating for the differences between PARs.

- Click OK to close the Scale dialog box.

In the Composition window, the layer appears with the rotation you set. If the stopwatch icon is not active for the layer, this is the scale of the layer for its duration. If the stopwatch is active, a scale keyframe is created at this frame.

**Tip**

If the pixel aspect ratio options leave you scratching your head, see the sidebar, "PAR Excellence" in Chapter 2.

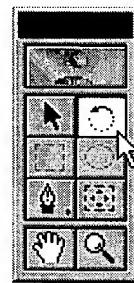
**Rotation**

When you rotate a layer, it rotates in two-dimensional space, using the anchor point as its pivot point.

**To rotate a layer by dragging:**

1. Select a layer.
2. In the Tools palette, choose the Rotate tool (Figure 7.29).

**Figure 7.29. Choose the Rotate tool.**



3. In the Composition window, drag a layer to rotate it around its anchor point.

As you drag, a bounding box represents the layer's new rotation position (Figure 7.30).

**Figure 7.30. In the Composition window, drag the layer to rotate it around its pivot point.**



**4.** Release the mouse to set the rotation.

In the Composition window, the layer appears with the rotation you set. If the stopwatch icon is not active for the layer, this is the rotation of the layer for its entire duration. If the stopwatch is active, a rotation keyframe is created at this frame.

**Tip**

As with the other spatial transform properties, press Option (Mac) or Alt (Windows) as you drag to see the changes applied to the actual image, not just a bounding box.

**Tip**

To reset the rotation of a selected layer to 0 degrees quickly, double-click the Rotate tool.

**Tip**

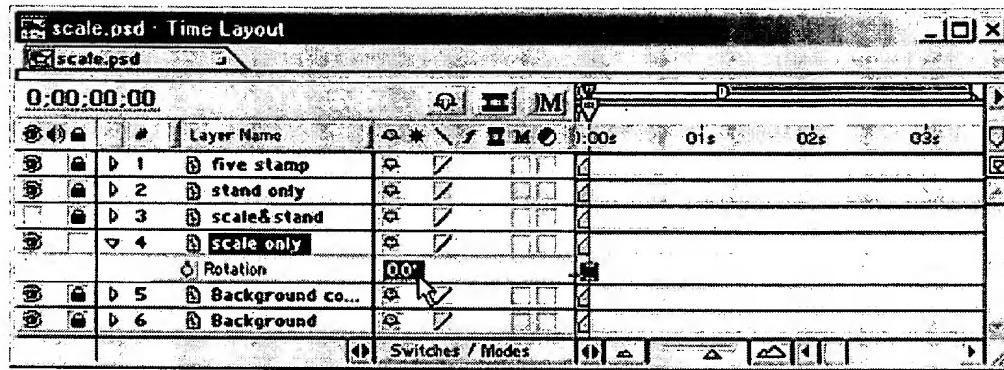
If you want an object to turn (rotate) in the direction of its motion (position), you can avoid the pain of setting a lot of rotational keyframes. Use the Auto-Orient Rotation command instead. See Chapter 13 for details.

**To rotate a layer numerically:**

**1.** Select a layer in the Time Layout window or Composition window.

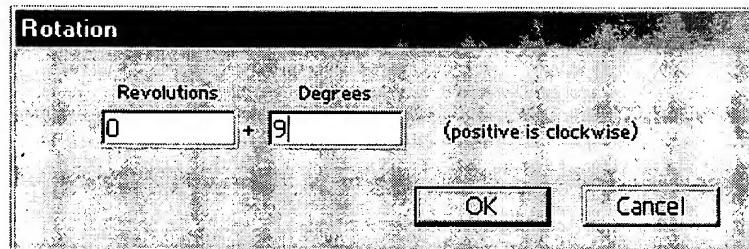
2. Press R to view the rotation property for the selected layer.
3. Click the layer's rotation value in the Switches/Modes panel of the Time Layout window (Figure 7.31).

**Figure 7.31. Click the rotation value to open the Rotation dialog box.**



A Rotation dialog box appears (Figure 7.32).

**Figure 7.32. In the Rotation dialog box, enter values for revolutions (rotations) and degrees. Positive numbers are clockwise, negative numbers are counterclockwise.**



4. In the Rotation dialog box, enter a value for revolutions (rotations).

You may enter an integer only. Each rotation equals 360 degrees. Enter partial rotations as degrees in the Degrees field. A negative value indicates a counterclockwise rotation.

5. In the Rotation dialog box, enter a value for Degrees.

You may enter decimals for partial degrees (not degree-minutes). A negative value indicates a counterclockwise rotation.

6. Click OK to close the dialog box.

In the Composition window, the layer appears with the rotation you set. If the stopwatch icon is not active for the layer, this is the rotation of the layer for its entire duration. If the stopwatch is active, a rotation keyframe is created at this frame.

### Rotational Values

Rotation is expressed as an absolute, not relative, value. You might even think of it as a rotational position. A layer's default rotation is 0 degrees; setting its rotation to 0 degrees always restores it to its original upright angle. This is true when you keyframe rotational values as well (see "To set keyframes for a property," later in this chapter). For example, if you want to rotate a layer 180 degrees clockwise (upside down) and back again, the rotation values at each keyframe would be 0, 180, and 0. Mistakenly setting values of 0, 180, -180 would cause the layer to turn clockwise 180 degrees, then turn counterclockwise—past its original position—until it's upside down again.

## Opacity

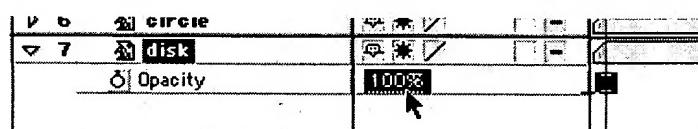
Strictly speaking, you control the overall opacity of layers in After Effects, not transparency. At any point in time, a layer can be anywhere from 0% opaque (completely transparent, and thereby invisible), to 100% opaque (with absolutely no transparency). However, the keyboard shortcut to display this property is still T. After all, O is already an important shortcut for cueing the current time to the selected layer's Out point. Don't worry; you'll adapt.

Bear in mind that the opacity property merely controls the overall opacity for the layer. There are plenty of other ways to define areas of transparency and opacity, including transfer modes, track mattes, keying effects, and masking techniques.

**To change the opacity of a layer:**

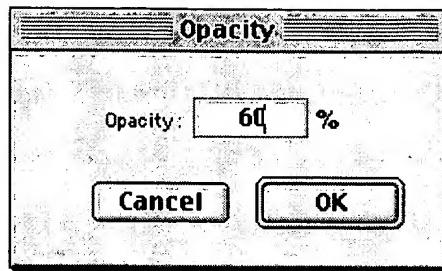
1. Select a layer in the Time Layout window or Composition window.
2. Press T to display the opacity property for the selected layer.
3. Click the layer's opacity value in the Switches/Modes panel of the Time Layout window (Figure 7.33).

**Figure 7.33. Click the opacity value display to open the Opacity dialog box.**



The Opacity dialog box opens (Figure 7.34).

**Figure 7.34. In the Opacity dialog box, enter a value from 0 to 100. You can enter decimal values.**



4. In the Opacity dialog box, enter a value for the opacity of the layer.

Enter a value from 0% to 100%. You may enter decimal values.

5. Click OK to close the dialog box.

In the Composition window, the layer appears with the opacity you set. If the stopwatch icon is not active for the layer, this is the opacity of the layer for its entire duration. If the stopwatch is active, an opacity keyframe is created at this frame.

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### Effects Fundamentals > Standard Effect Categories

## Chapter 10. Effects Fundamentals

At last, you come to the long menu: Effects. As if you didn't already know, effects alter the audio or visual characteristics of layers in almost countless ways. You can use them to enhance, combine, or distort layers. You can simulate audio-visual phenomenon from light to lightning. You can make changes that are subtle or spectacular. And most important, you can animate these effects over time.

While the Mask and Transform properties are calculated without the use of outside assistance, so to speak, effects are stored in the Plug-Ins folder contained in the After Effects folder. The number and type of effects at your disposal depend on whether you have the standard version of After Effects, or the Production Bundle. You can also enhance your repertoire of effects with those created by a number of third-party developers.

This chapter is the first of two chapters that cover effects. Together, they move from the general to the specific. The chapter begins with an overview of effect categories, and explains the process you use to apply any effect to a layer. It moves on to describe how to use the Effect Controls window as a complement or alternative to the standard property controls in the layer outline. The next chapter focuses on each category in the standard set of effects, highlighting prime examples. As always, the sections are peppered with valuable tips and sidebars explaining essential background information.

### Standard Effect Categories

The effects in the Effects menu are organized into several categories, depending on their functions. When you add third-party plug-ins, you can usually choose whether the added effects appear under an existing category, or create their own.

- **Adjust** alters the colors or brightness of a layer.
- **Audio** processes audio.
- **Blur and Sharpen** make a layer's image appear out of focus or more in focus.
- **Channel** manipulates the individual channels of a layer—red, green, blue, or alpha—and the color information derived from them.
- **Cineon** contains the Cineon converter necessary to use film images transferred to the Cineon file format.
- **Distort** deforms or distorts a layer's image.

- **Image Control** alters the color values of a layer image.
- **Keying** makes areas of an image transparent, based on color or brightness.
- **Perspective** simulates positioning a layer in three-dimensional space.
- **Render** creates graphical elements.
- **Stylize** alters the pixels of the image in a number of ways to produce abstracted, stylized effects.
- **Text** creates text elements.
- **Time** alters the layer image based on its timing.
- **Transition** pertains to effects designed to transition between layers, or how images gradually replace others.
- **Video** prepares images for video output.

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**Keyframe Interpolation > Spatial and Temporal Interpolation**

### Chapter 13. Keyframe Interpolation

In Chapter 7, you learned to animate any layer property over time by setting key frames. By defining only the most important, or "key" frames, you assume the role of head animator. After Effects acts as your assistant animator, providing all the in-between frames, or "tweens." The method After Effects uses to determine the values at the tweens is known as its interpolation method.

Fortunately, you can instruct your assistant animator to use a range of interpolation methods. Some methods create steady changes from one keyframe to the next; others vary the rate of change. Movement can take a direct path or a curved route; an action can glide in for a soft landing or blast off in a burst of speed.

Without a choice of interpolation methods, your loyal assistant's abilities would be severely limited. If animated values always proceeded directly and mechanically from one keyframe to another, all but the most basic animations would seem lifeless and robotic. To create a curved movement would require so many keyframes you'd begin to wonder why you had an assistant at all. Calculating acceleration or deceleration in speed would present an even more difficult problem.

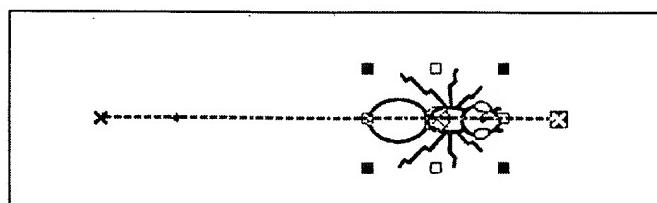
This chapter explains how you can assign various interpolation methods to keyframes to impart nuance and variation to your animations. You'll not only learn to decipher how After Effects depicts the ineffable qualities of motion, speed, and acceleration, but also how it harnesses them. In the process, you'll begin to realize that there's a big difference between animating something and bringing it to life.

### Spatial and Temporal Interpolation

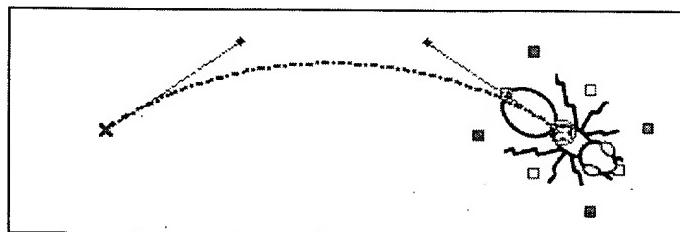
After Effects applies interpolation methods to two categories of information: spatial and temporal.

Spatial interpolation refers to how After Effects calculates changes in position. In other words, how a layer or its anchor point literally moves in the two dimensional space of the composition. Does it proceed directly from one keyframe to the next, or does it take a curved route? (Figure 13.1 and Figure 13.2).

**Figure 13.1. Spatial interpolation determines how After Effects calculates changes in position between keyframes. Movement may proceed directly...**

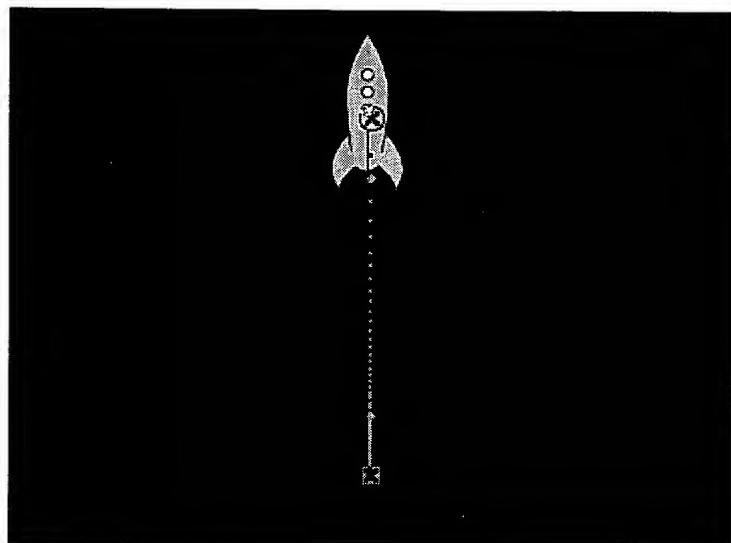


**Figure 13.2. ...or take a more curved, indirect route.**

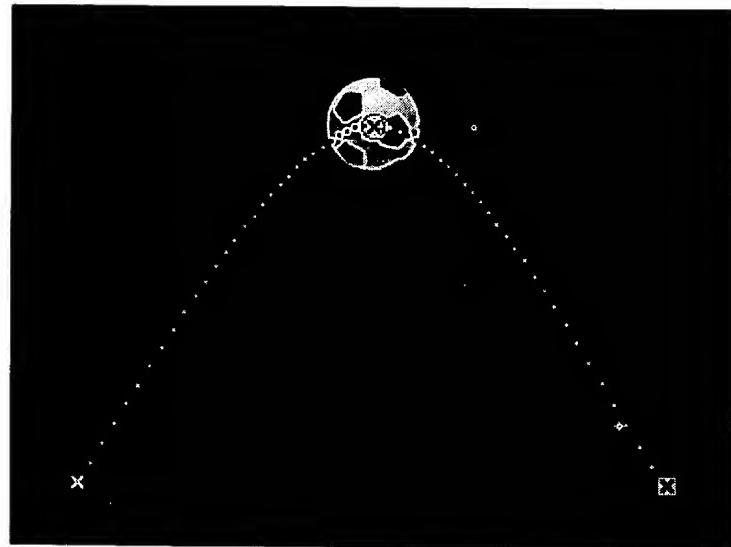


*Temporal interpolation* refers to any property value's rate of change between keyframes. Does the value change at a constant rate from one keyframe to the next, or does it accelerate or decelerate? (Figure 13.3 and Figure 13.4).

**Figure 13.3. Temporal interpolation determines how After Effects calculates changes in speed or velocity. Temporal interpolation can create acceleration...**



**Figure 13.4. ...or deceleration between keyframes.**

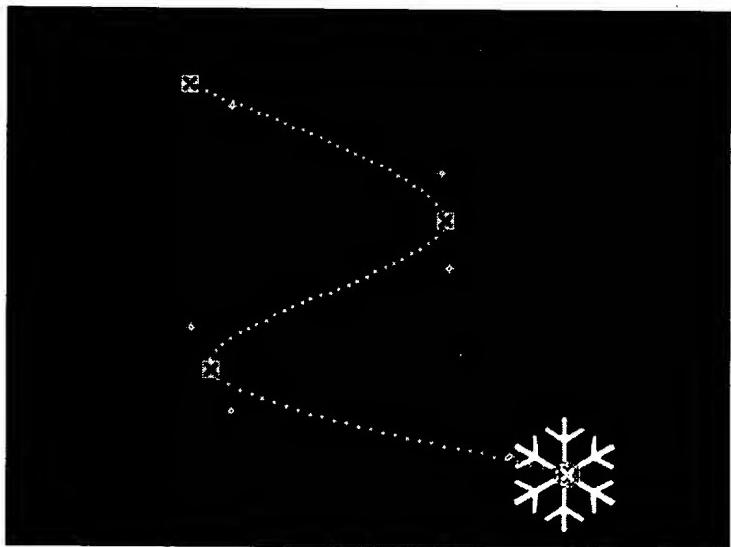


After Effects calculates both spatial and temporal interpolation using the same set of methods, or interpolation types. Controlling the interpolation between keyframes allows you to set fewer keyframes than you could otherwise, without sacrificing precise control over your animation.

### Spatial Interpolation and the Motion Path

Spatial interpolation is represented as a motion path (Figure 13.5). Changes in a layer's position value appear as a motion path in the Composition window; changes in a layer's anchor point value appear in its Layer window. You can directly manipulate the motion path to control the movement precisely from one keyframe to the next. You'll find that editing the motion path works the same way as editing an open mask path. Although the motion path does give you a rough indication of speed, it doesn't allow you to control the speed or the temporal interpolation accurately.

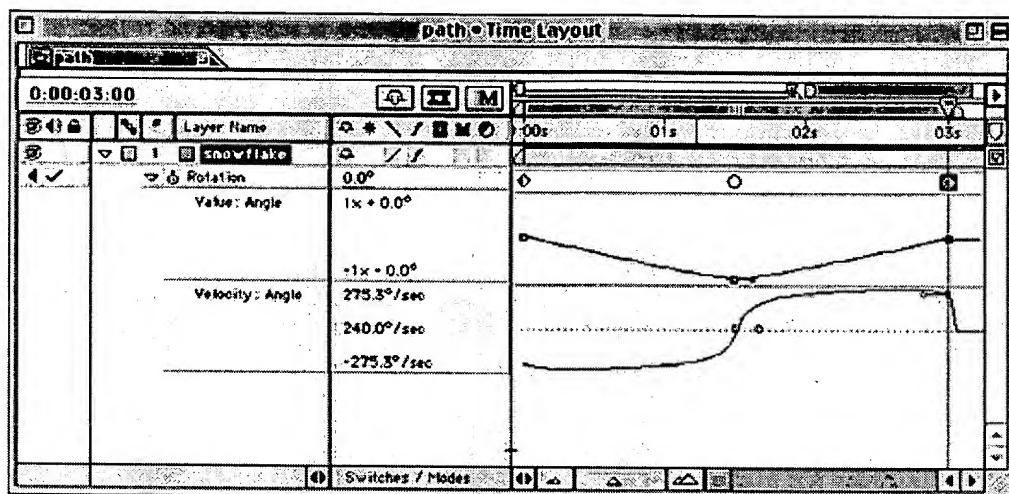
**Figure 13.5. You can view and control spatial interpolation in the motion path.**



### Temporal Interpolation and the Value, Speed, and Velocity Graphs

Temporal interpolation is displayed in a speed graph (for spatial properties) or in a value graph and velocity graph (for other properties). When you expand a layer property, these graphs appear in the time graph of the Time Layout window (Figure 13.6). You can directly manipulate the graphs to control precisely the speed and acceleration of a value from one keyframe to the next. Although changing the curve of a graph is not unlike changing the curve of a motion path, its meaning can be harder to grasp. Before you can take advantage of the control these graphs provide, you must first understand how each curve corresponds to rates of change from one keyframe to the next.

**Figure 13.6. You can view and control temporal interpolation in a speed, value, or velocity graph.**



Keep reading to find out about each interpolation type, and how each one works spatially. Then move on to learn about the temporal effects of interpolation.

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### Keyframe Interpolation > Interpolation Types

## Interpolation Types

With the exception of hold interpolation, After Effects calculates both spatial and temporal interpolation using the same set of methods.

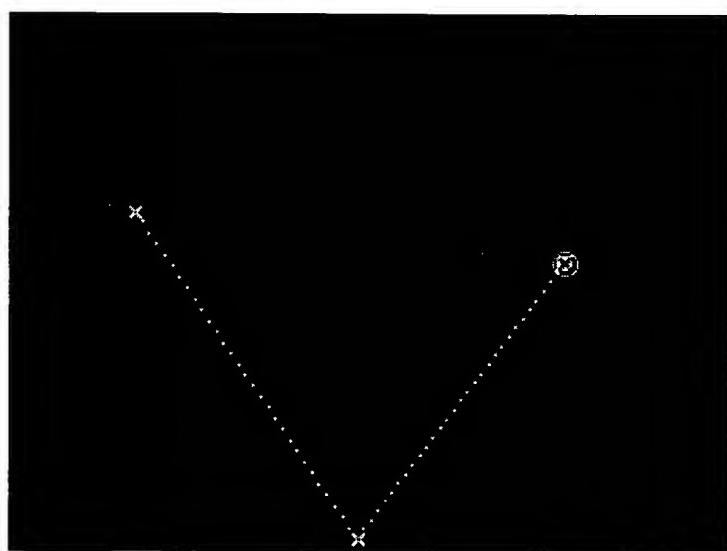
### No Interpolation

No interpolation is applied to properties that have no keyframes and are not animated. Static properties display an I-beam icon in the layer outline, rather than keyframes, and the stopwatch icon is not selected.

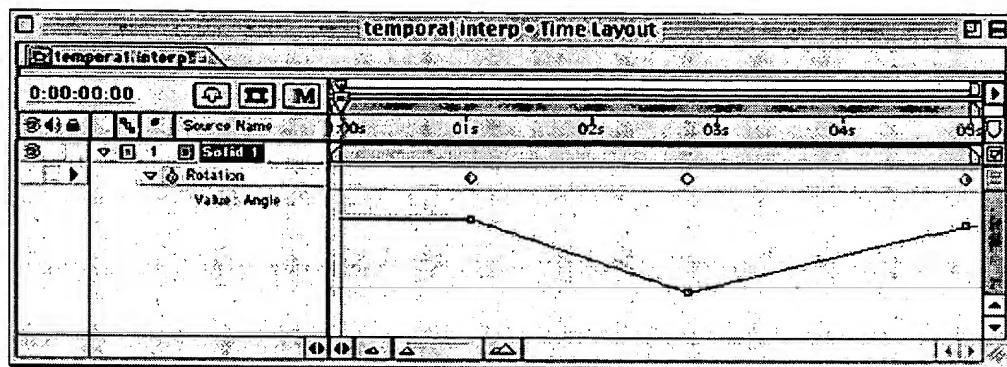
### Linear

Linear interpolation dictates a constant rate of change from one keyframe to the next. Spatially, linear interpolation defines a straight path from one keyframe to the next; temporally, linear interpolation results in a constant speed between keyframes (Figure 13.7 **and** Figure 13.8).

**Figure 13.7. Linear interpolation calculates changes in a linear fashion. Spatially, linear interpolation defines a straight path.**



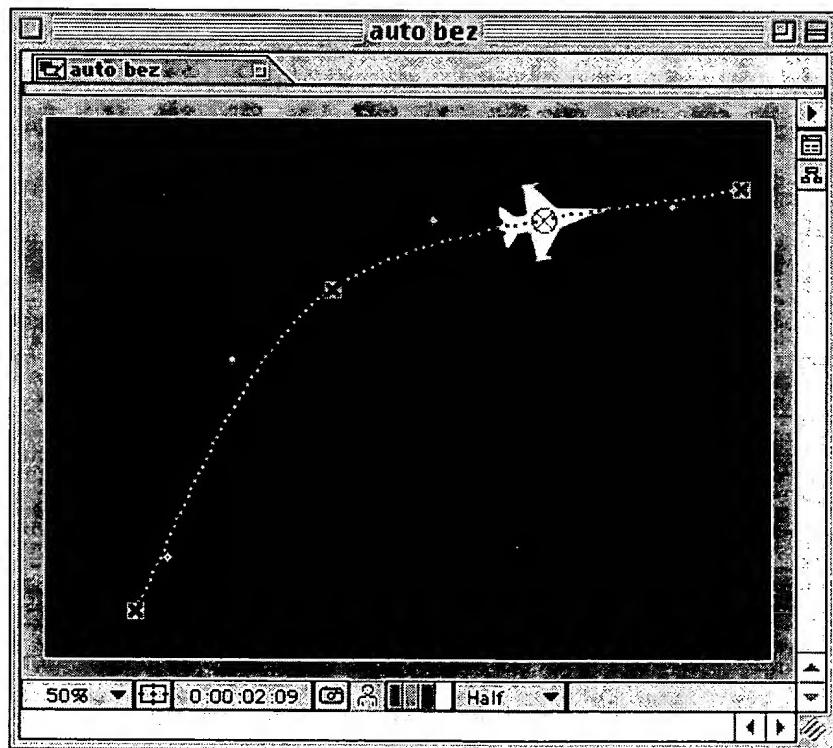
**Figure 13.8.** Temporally, linear interpolation results in a constant rate of change between keyframes.



## Auto Bézier

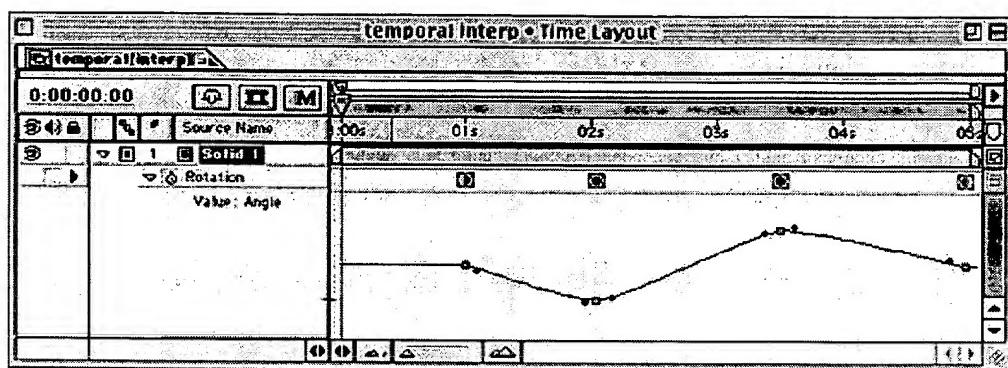
Auto Bézier interpolation automatically reduces the rate of change equally on both sides of a keyframe. Spatially, a keyframe set to auto Bézier is comparable to a smooth point, with two equal direction lines extending from it. It results in a smooth, symmetrical curve in a motion path. Temporally, auto Bézier interpolation reduces the rate of change equally before and after a keyframe, creating a gradual deceleration that eases into and out of the keyframe (Figure 13.9 and Figure 13.10).

**Figure 13.9.** Auto Bézier interpolation creates a curved path, with equal incoming and outgoing interpolation.



**Figure 13.10.** Temporally, auto Bézier interpolation reduces the rate of change equally before

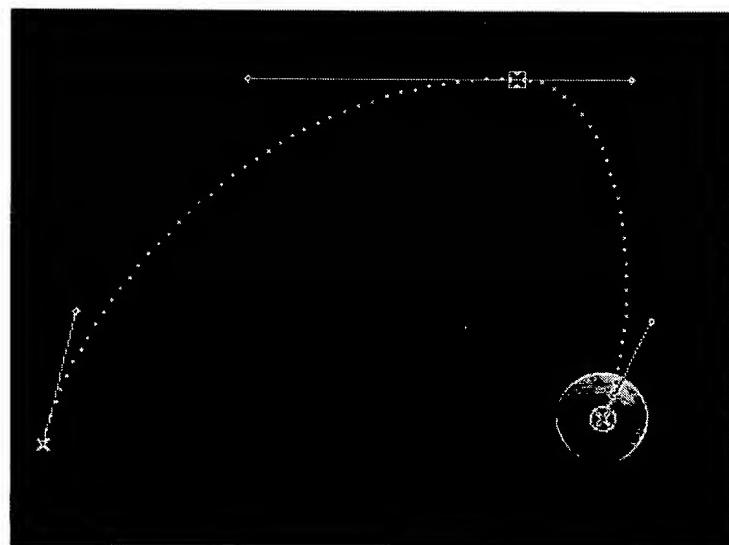
and after a keyframe.



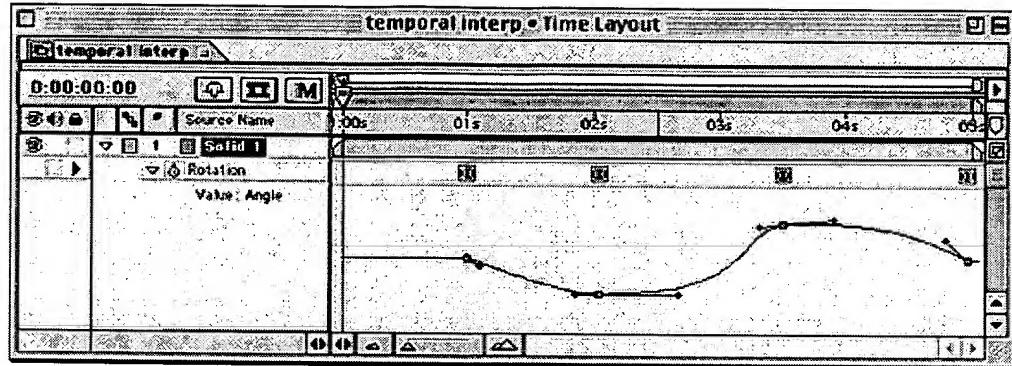
## Continuous Bézier

Like auto Bézier, continuous Bézier interpolation reduces the rate of change on both sides of a keyframe. However, continuous Bézier interpolation is set manually, so it does not affect the incoming and outgoing rates of change equally. In the motion path, continuous Bézier interpolation results in a smooth and continuous, but asymmetrical, curve. In the value graph, continuous Bézier interpolation manually and unequally reduces the rate of change before and after a keyframe (Figure 13.11 and Figure 13.12).

**Figure 13.11.** You manually set continuous Bézier interpolation to create an asymmetrically curved path.



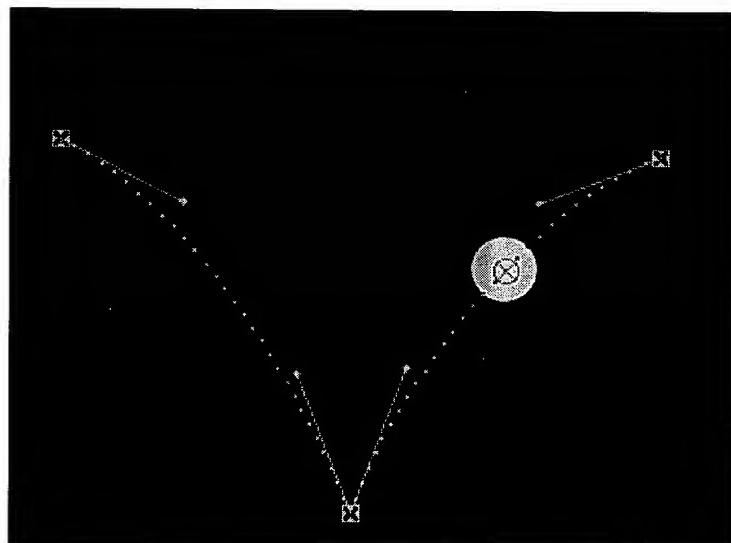
**Figure 13.12.** Continuous Bézier interpolation reduces the rate of change by different amounts on either side of a keyframe.



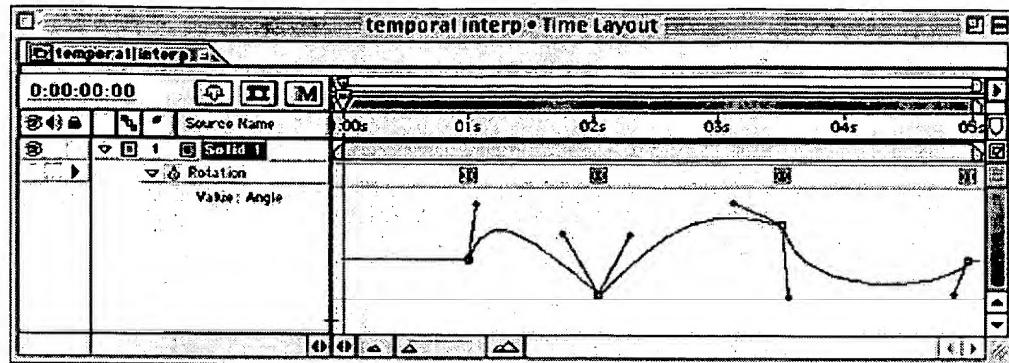
## Bézier

Like continuous Bézier, you set Bézier interpolation manually. Bézier interpolation can either decrease or increase the rate of change on either or both sides of a keyframe. Spatially, Bézier keyframes are comparable to a corner point in an open mask path. As in a corner point, the direction lines extending from the keyframe are unequal and discontinuous. In a motion path, Bézier interpolation creates a discontinuous curve, or cusp, at the keyframe. In the value graph, Bézier interpolation can reduce or increase the rate of change before and after a keyframe (Figure 13.13 and Figure 13.14). For example, Bézier interpolation can be used to create a sharp acceleration at a keyframe, such as when a ball falls and bounces; or a sharp deceleration, as when the ball ascends to its apex and begins to fall again.

**Figure 13.13. Bézier interpolation can allow the motion path to take discontinuous curves.**



**Figure 13.14. Temporally, Bézier interpolation can create quick acceleration and deceleration.**



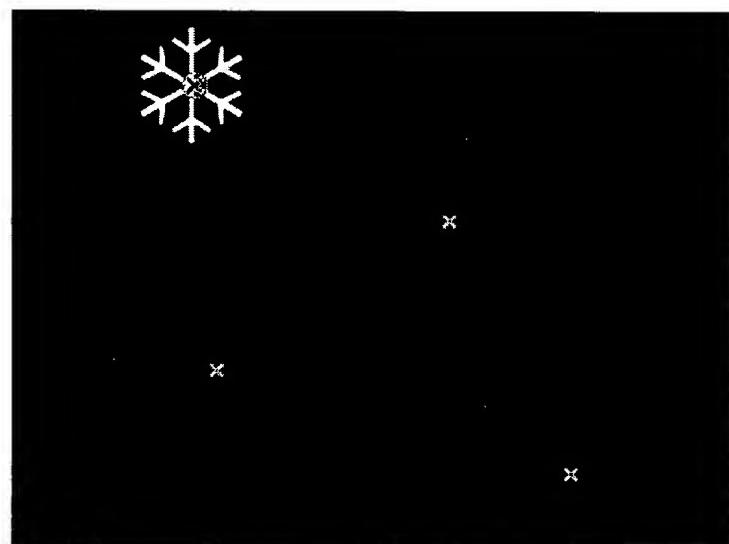
### Qu'est-ce que c'est Bézier? Qui est Bézier ?

In case your French is a little rusty, you pronounce Bézier, "bez ee yay," after the late Pierre Etienne Bézier. He developed the math behind his namesake curve in the 1970s for use in computer-aided design and manufacture. The same math became the basis for Adobe Post script fonts, path-based drawing, and yes, interpolation methods used in computer animation. Bézier died on November 25, 1999. Merci, Monsieur Bézier.

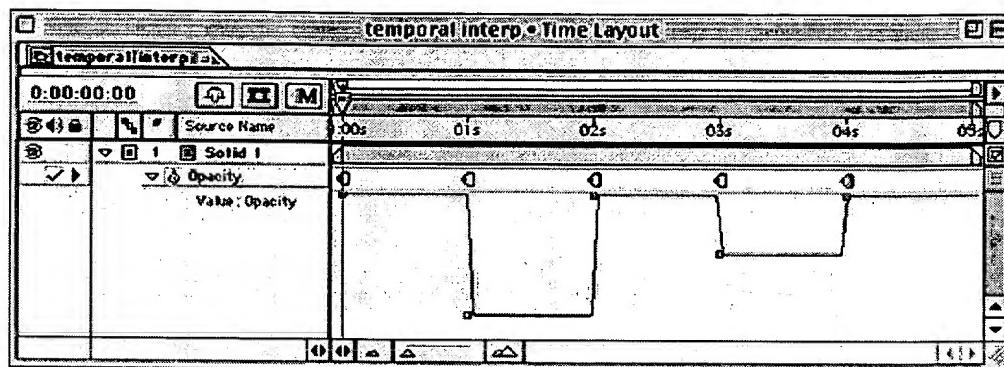
## Hold

Though its effects can be observed both spatially and temporally, hold interpolation is a strictly temporal interpolation type. Hold interpolation ceases the value change at the keyframe. The value remains fixed until the current frame of the composition reaches the next keyframe, where the property is set to a new value instantly. For example, specifying hold keyframes for a layer's position property can cause it to disappear suddenly and reappear in different places. When hold interpolation is applied to position keyframes, no motion path connects the keyframes displayed in the Composition window (Figure 13.15 and Figure 13.16).

**Figure 13.15.** Keyframes of spatial properties that use hold interpolation remain frozen in position until the next keyframe, where they suddenly reappear.



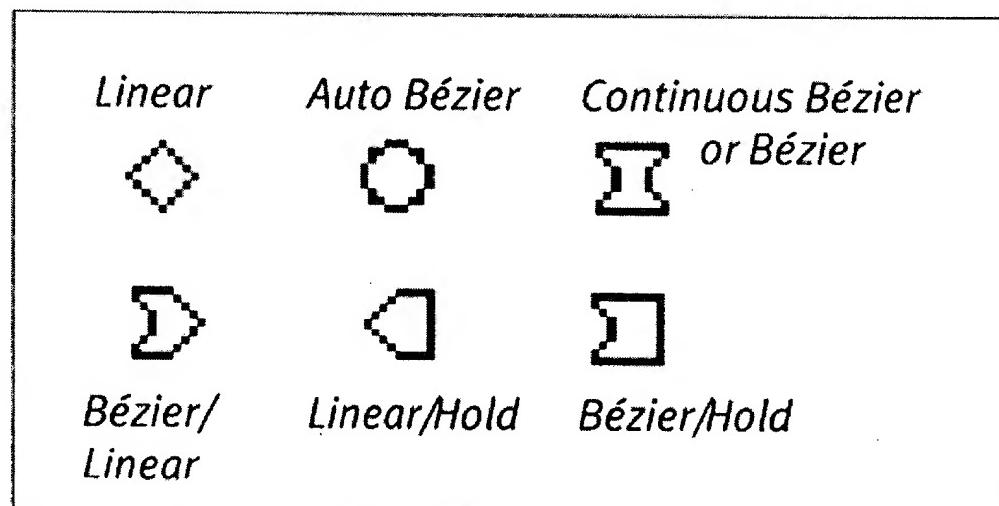
**Figure 13.16. Keyframes of other properties that use hold interpolation also retain their current value until the next keyframe. The speed of a held property displays as 0.**



### **Mixed Incoming and Outgoing Interpolation**

A keyframe can use different interpolation types for its incoming and outgoing interpolation. A keyframe's incoming and outgoing spatial interpolation can be a mix of linear and Bézier. A keyframe's temporal interpolation may use any combination of linear, Bézier, and hold for its incoming and outgoing interpolation (Figure 13.17).

**Figure 13.17.** Keyframes indicate whether they use different incoming and outgoing interpolation.



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### Keyframe Interpolation > Adjusting Temporal Interpolation Numerically

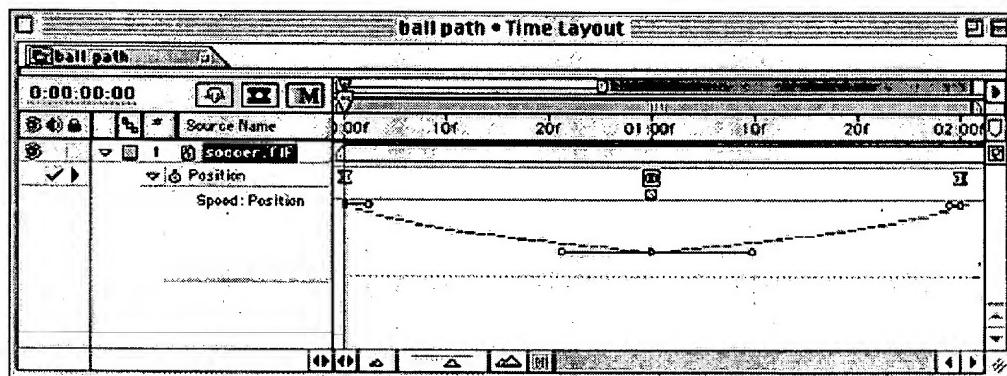
## Adjusting Temporal Interpolation Numerically

If using the speed or velocity graph doesn't provide the precision you need, you can make speed or velocity adjustments numerically.

### To change the speed or velocity numerically:

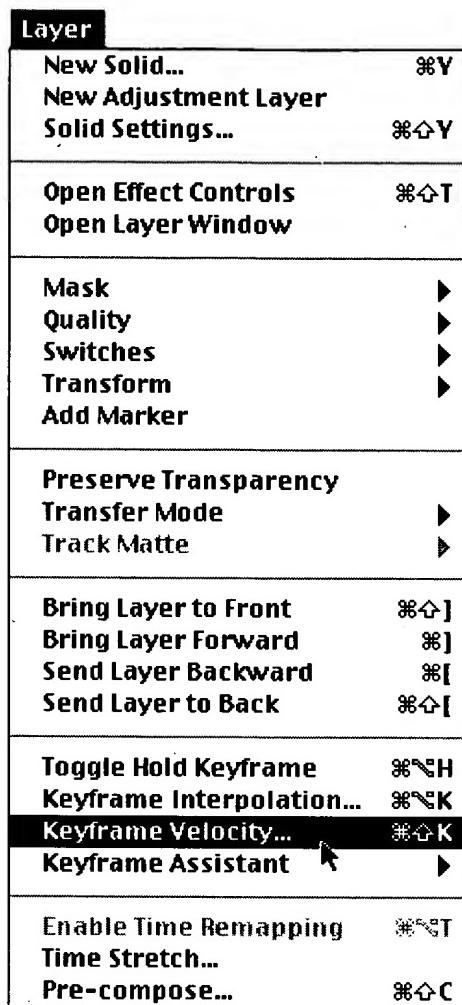
1. Expand the layer outline to view the speed or velocity graph for an animated layer property.
2. Select the keyframe you want to adjust (Figure 13.82).

**Figure 13.82. Select the keyframe you want to adjust.**



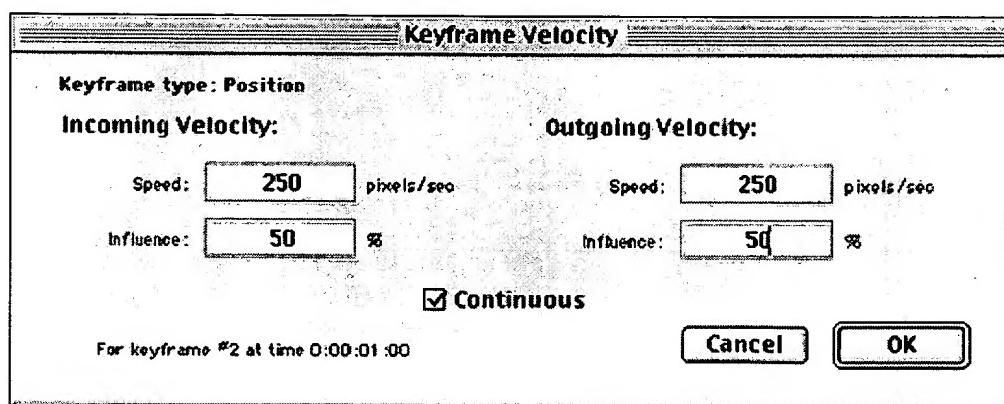
3. Choose Layer > Keyframe Velocity (Figure 13.83).

**Figure 13.83. Choose Layer > Keyframe Velocity.**



A Keyframe Velocity dialog box appears, displaying the type of property you are adjusting (Figure 13.84).

**Figure 13.84. A Keyframe Velocity dialog box appears.**



4. In the Keyframe Velocity dialog box, enter values for the incoming velocity and outgoing velocity.

The unit of measurement used by the velocity value depends on the property.

5. In the Incoming Velocity section of the dialog box, enter a value for Influence.

This affects the amount of influence the value of the previous keyframe exerts over the interpolated values. In the graph, it affects the length of the ease handle.

6. In the Outgoing Velocity section of the dialog box, enter a value for Influence.

This affects the amount of influence the value of the next keyframe exerts over the interpolated values.

To automatically maintain equal values for the Incoming and Outgoing Velocities, check Continuous.

7. Click OK to close the Keyframe Velocity dialog box.

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**Output > Choosing Render Settings**

## Choosing Render Settings

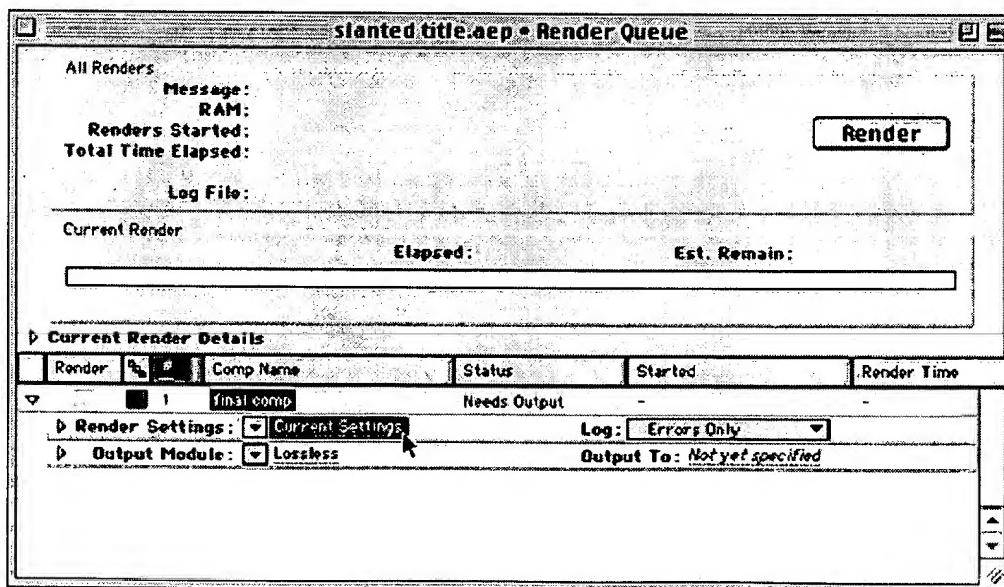
The render settings comprise the first step in the rendering process. Render settings dictate how each frame of the composition is calculated for the final output, in much the same way the composition's settings calculate frames for playback in the Composition window.

Initially, the render settings are set to match the composition's current settings. Though the current settings may meet your output goals in some instances, it's best to take a more active role in choosing render settings. Selecting each render setting or using a template of settings ensures that every layer of the composition—including layers in nested compositions—use the settings you want before they are saved to disk.

**To choose render settings manually:**

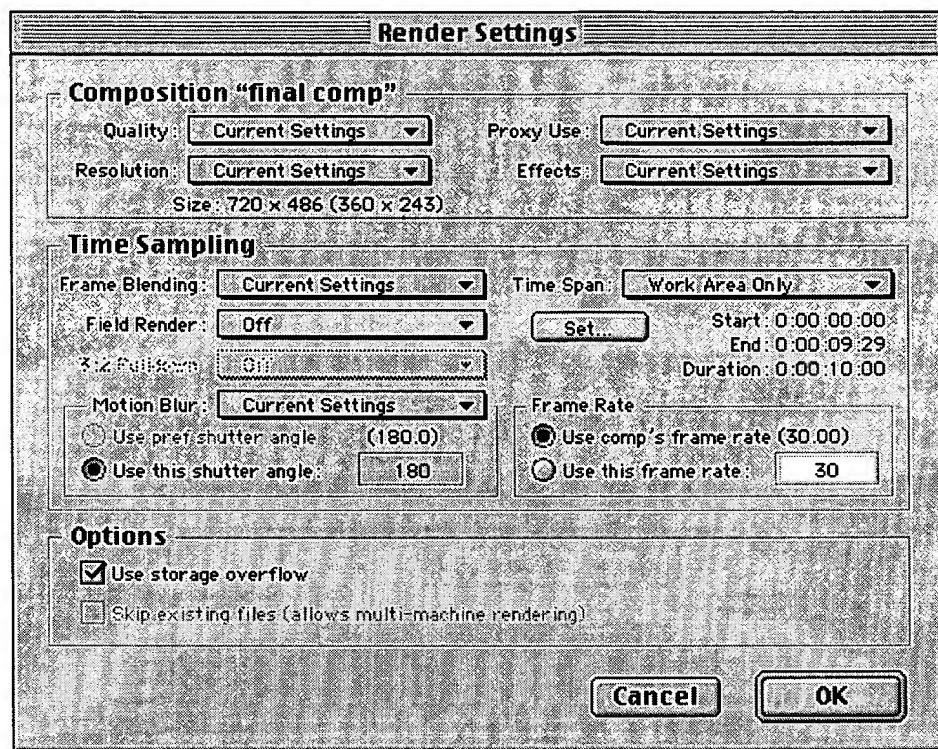
1. In the render queue, click the underlined name of the render settings (Figure 16.26).

**Figure 16.26. In the render queue, click the underlined name of the render settings.**



A Render Settings dialog box appears (Figure 16.27).

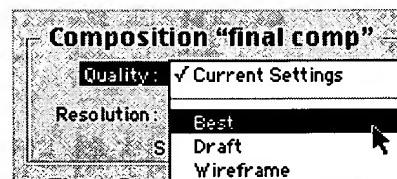
**Figure 16.27.** In the Render Settings dialog box, specify various settings for rendering the frames of the composition.



2. In the Render Settings dialog box, make a selection for each of the following options:

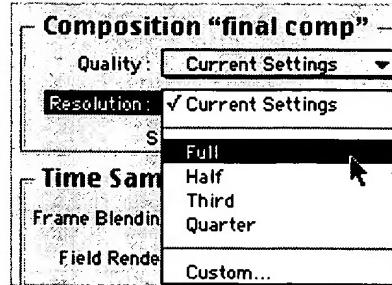
**Quality** sets the quality for all layers. (See "Quality Setting Switches," in Chapter 5.) (Figure 16.28).

**Figure 16.28.** Set the quality setting for all layers from the Quality pull-down menu.



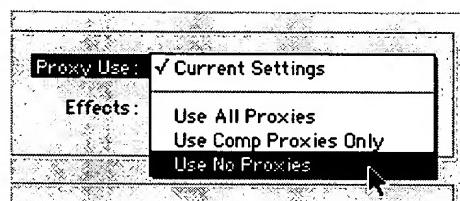
**Resolution** sets the resolution for all layers in the composition. (See "Resolution," in Chapter 4.) Setting the resolution to half, for example, renders every other pixel and results in an image half the dimensions of the full-sized composition (Figure 16.29).

**Figure 16.29.** Set the resolution for all layers in the composition in the Resolution pull-down menu.



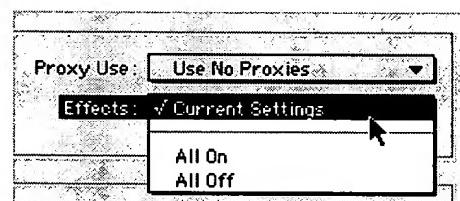
**Proxy Use** specifies whether proxies or source footage will be used for output (Figure 16.30). (See "Using Proxies and Placeholders," in Chapter 3.)

**Figure 16.30. Specify whether proxies or source footage will be used for output in the Proxies pull-down menu.**



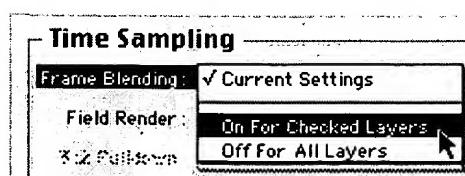
**Effects** specifies whether effects will appear in the output. (See "Enabling and Disabling Effects," in Chapter 10.) Set Effects to All On to enable all effects, including ones you had disabled temporarily; set to Current to exclude effects you disabled deliberately (Figure 16.31).

**Figure 16.31. In the Effects menu, specify whether effects will appear in the output.**



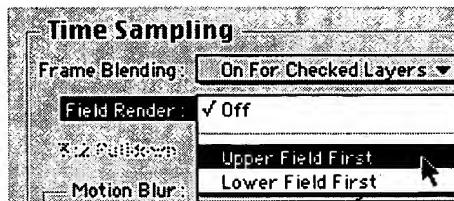
**Frame Blending** specifies whether frame blending will be applied to layers with the Frame Blending switch enabled (regardless of the Frame Blending setting for the composition) (Figure 16.32). (See "Using Frame Blending," in Chapter 12.)

**Figure 16.32. In the Frame Blending pull-down menu, specify whether frame blending will be applied to layers with the Frame Blending switch enabled.**



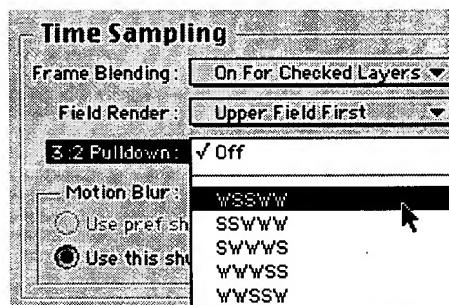
**Field Render** specifies whether to field render the output movie, and if so, which field is dominant. (See the sidebar, "Interlaced Video and Field Order," in Chapter 2.) Set to None unless the output is destined for video (Figure 16.33).

**Figure 16.33.** In the Field Render pull-down menu, choose whether to field render the output.



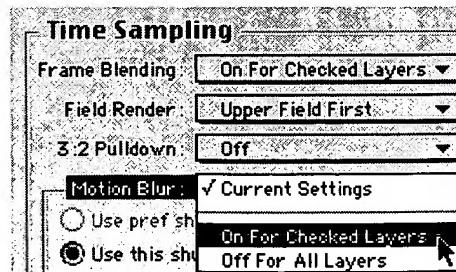
**3:2 Pulldown** specifies whether to reintroduce pulldown to the footage, and determines the phase of the pulldown. (See the sidebar, "The Lowdown on Pulldown," in Chapter 2.) Selecting the proper phase is only required if the movie will be cut back into the original footage (Figure 16.34).

**Figure 16.34.** To reintroduce pulldown to the footage, choose an option from the 3:2 Pulldown menu.



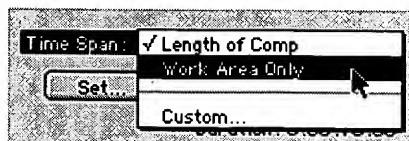
**Motion Blur** specifies whether motion blur will be applied to layers with the Motion Blur switch enabled (regardless of the Motion Blur setting for the composition). When you enable motion blur, choose either the preferred shutter angle or enter a custom shutter angle. (See "Using Motion Blur," in Chapter 12.) A setting of 360 degrees results in the maximum motion blur (Figure 16.35).

**Figure 16.35.** In the Motion Blur pull-down menu, specify whether motion blur will be applied to layers with the Motion Blur switch enabled.



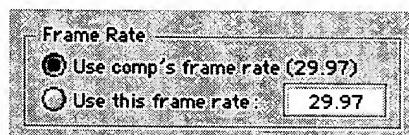
**Time Span** defines the part of the composition for output. Choosing Custom from the Time Span pull-down menu or clicking the Set button opens a Custom Time Span dialog box (Figure 16.36). (See "Setting the Work Area" in Chapter 8.)

**Figure 16.36. Define the part of the composition for output in the Time Span pull-down menu.**



**Frame Rate** sets the frame rate used to render the composition. You may select the frame rate of the composition, or enter a custom frame rate. (See "Frame Rate," in Chapter 4.) As you recall from Chapter 4, the Frame Rate setting does not affect the speed of playback, just the smoothness (Figure 16.37).

**Figure 16.37. Select the frame rate of the composition, or enter a custom frame rate.**



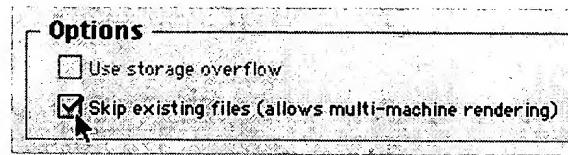
**Use Storage Overflow** sets whether rendering continues to an overflow volume when the output file exceeds the capacity of the first storage volume (Figure 16.38). (See "Setting Overflow Volumes," later in this chapter.)

**Figure 16.38. Check Use Storage Overflow to ensure rendering continues to an overflow volume when the output file exceeds the capacity of the first storage volume.**



**Skip Existing Files** enables After Effects to render or re-render frames of an existing frame sequence. This option also allows multiple computers to render parts of the same image sequence to a Watch folder (Figure 16.39). (Consult your After Effects documentation for more about network rendering features.)

**Figure 16.39. Check Skip Existing Files to enable After Effects to render or re-render frames of an existing frame sequence.**



3. Click OK to close the Render Settings dialog box and return to the Render Queue window.

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**Standard Effects in Action > Using the Compound Blur Effect****Using the Compound Blur Effect**

The Compound Blur effect is a little less straightforward than the other blur and sharpen effects, largely because it's a compound effect. (Compound effects are discussed in more detail in Chapter 10.) Like all compound effects, the Compound Blur effect requires a *target layer* (the layer you want to blur) and a *source layer* (which serves as the blur layer). The blur layer can be any grayscale image—bright areas cause more blur, dark areas cause less blur. For the most predictable results, the blur layer should have the same dimensions as the target layer.

**To use the Compound Blur effect:**

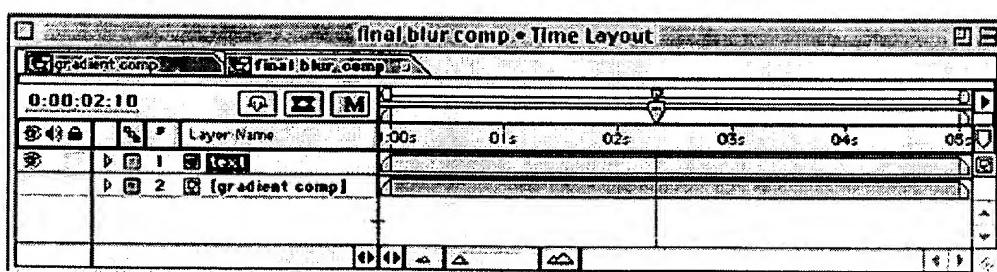
1. Place the two layers to be blurred in the composition.

The target layer will serve as the visible, blurred layer, while the source layer will define the areas to be blurred.

Because brightness levels define the degree of blurriness, a grayscale image will suffice for the source layer.

2. In the Time Layout window, click the eye icon for the source layer, to turn off its visibility (Figure 11.23).

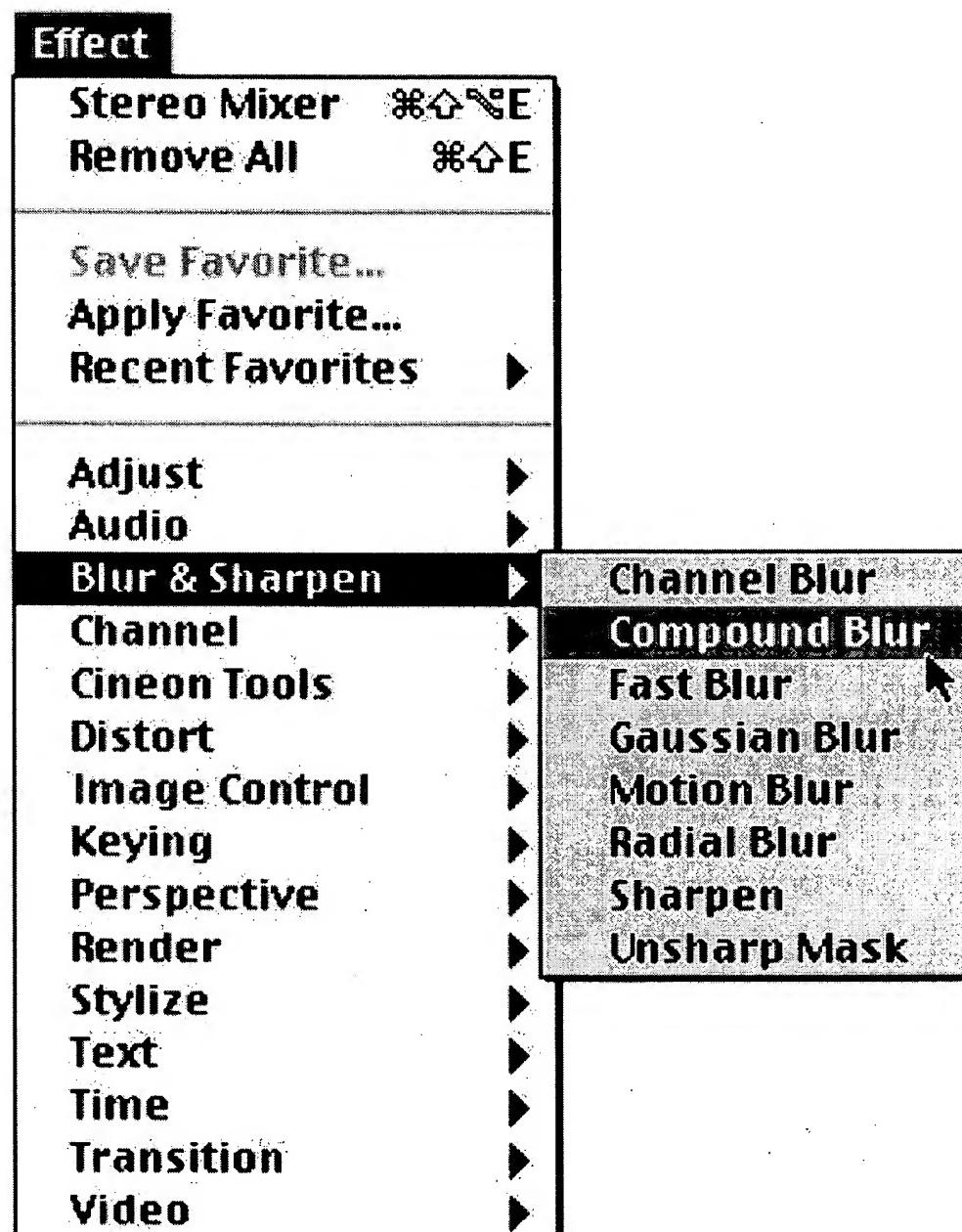
**Figure 11.23. Arrange a target layer and an effect source (or blur layer) in a composition. Switch off the video for the blur layer by clicking the eye icon.**



The eye icon disappears, preventing the source layer image from appearing in the composition.

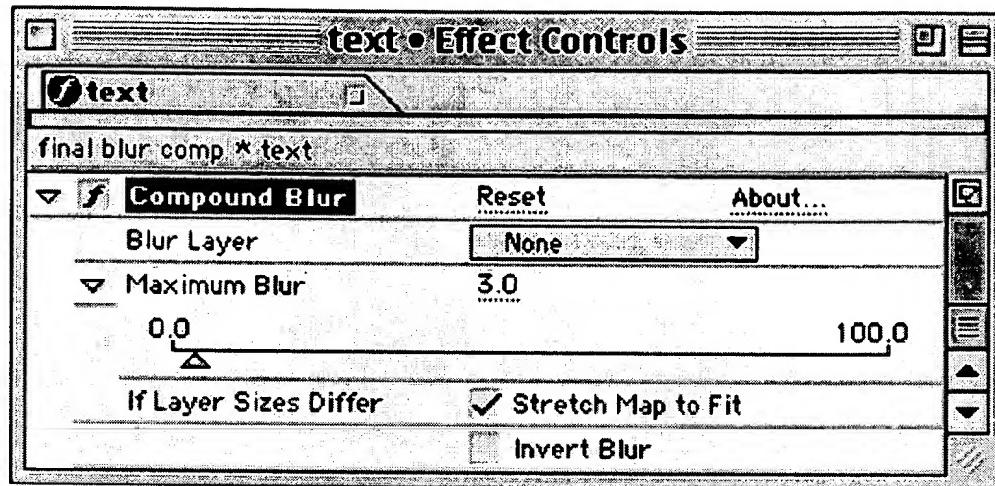
3. Select the target layer and choose Effect > Blur & Sharpen > Compound Blur (Figure 11.24).

Figure 11.24. Choose Effect > Blur & Sharpen > Compound Blur.



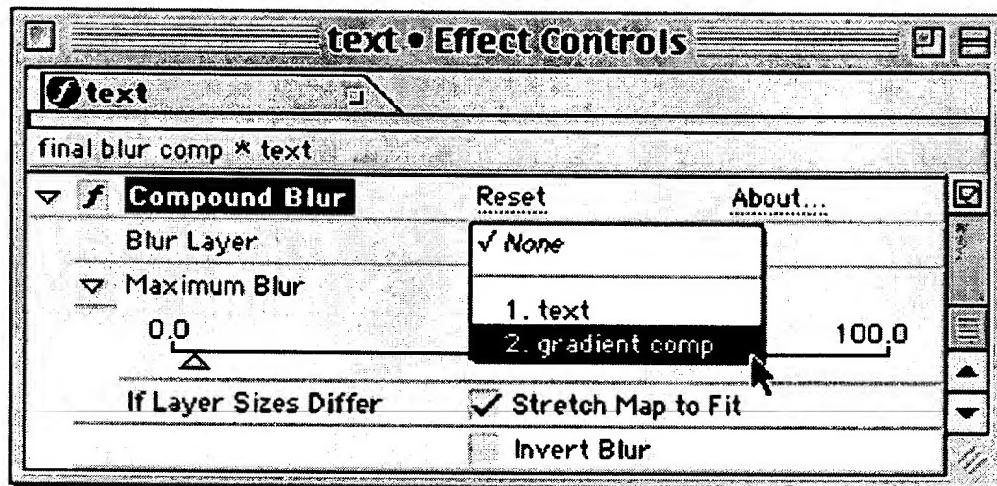
The Effect Controls window appears with the layer's Compound Blur effect selected (Figure 11.25).

Figure 11.25. The Effect Controls window appears with the layer's Compound Blur effect selected.



4. In the Effect Controls window, choose the source layer from the Blur Layer pull-down menu (Figure 11.26).

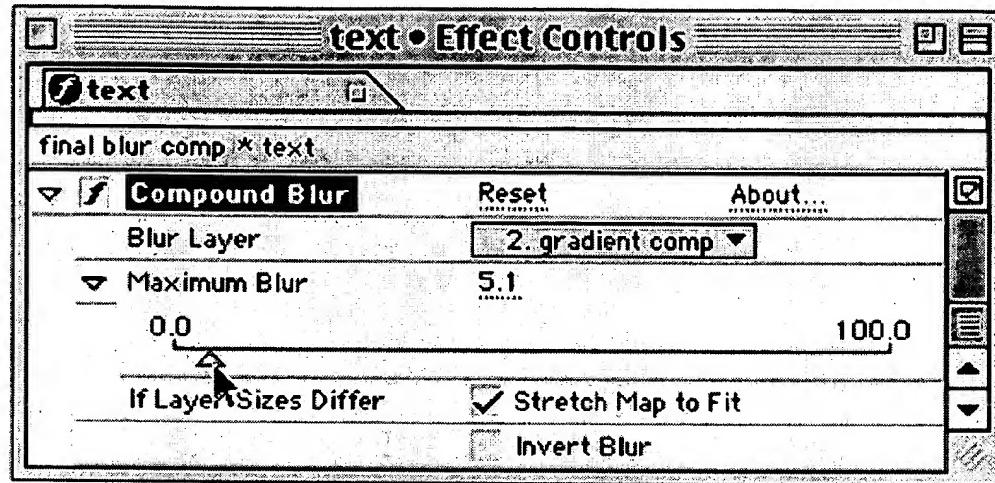
**Figure 11.26. Choose the source layer from the Blur Layer pull-down menu.**



5. Choose any of the following options, as necessary:

**Maximum Blur value**— sets the upper limit for the amount of blur caused by the brightest areas of the blur layer (the source layer) (Figure 11.27).

**Figure 11.27. Set the Maximum Blur value.**

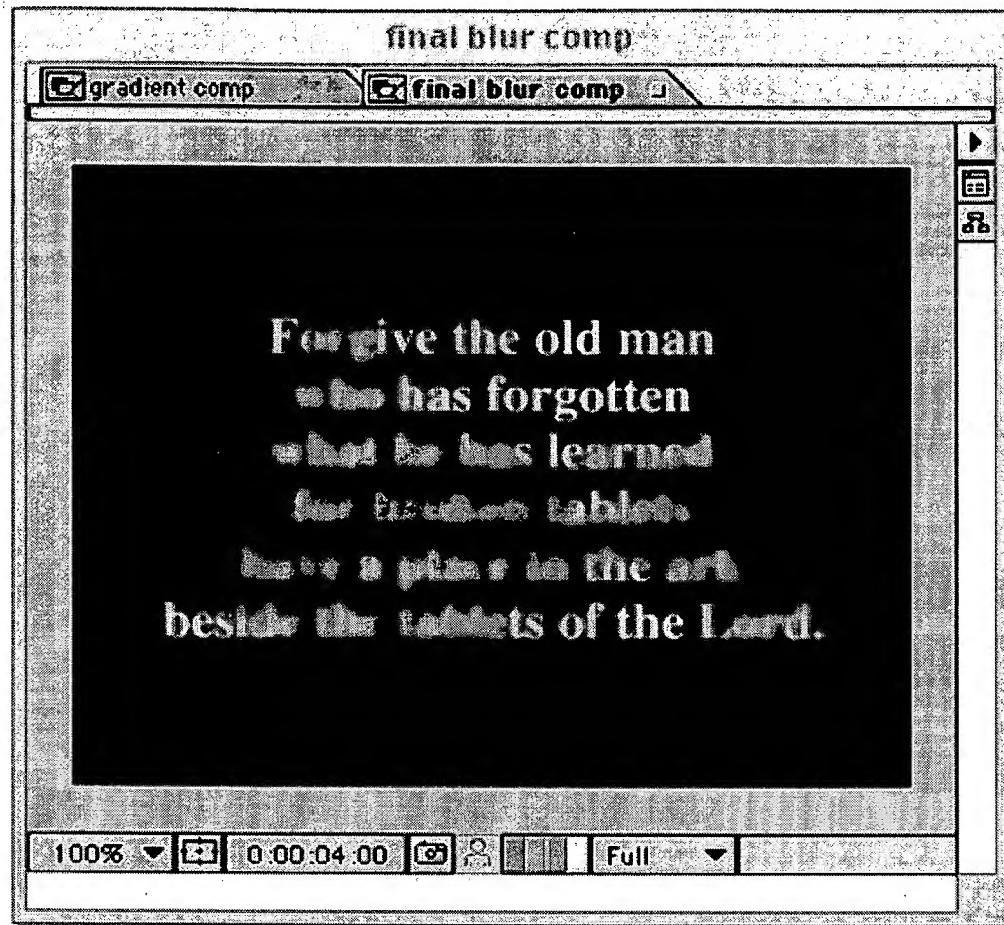


**Stretch Map to Fit**—resizes the source layer to match the size of the target layer.

**Invert Blur**—reverses the blurring effects of the bright and dark areas of the source layer.

The source layer defines the amount of blur in the target layer. The brightness values of the source layer determine the areas and intensity of the effect in the target layer (Figure 11.28). Brighter areas result in more blur.

**Figure 11.28. The brightness values determine the areas and intensity of the blur effect in the target layer.**

**Tip**

Before you add one of the blur effects, you should be aware that the Motion Blur switch automatically adds a blur to moving objects (see Chapter 12).

**Tip**

If you don't have any ready-to-use blur layer footage, why not create your own? You can use a combination of solids, masks, or effects to create a dynamic grayscale movie. Add one of the other blur effects to soften it into a useable blur map.

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**Standard Effects in Action > Using the Blend Effect**

## Using the Blend Effect

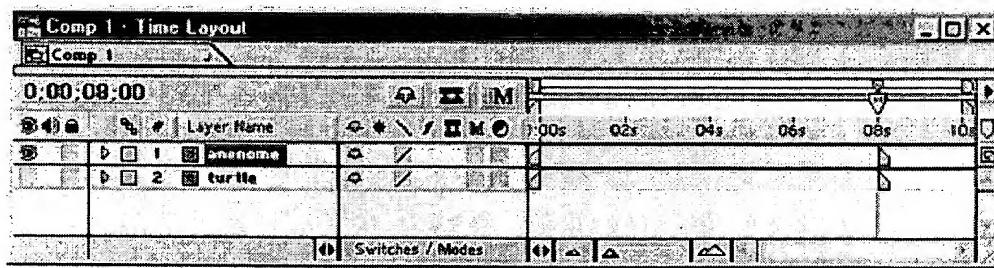
Blend is a compound effect designed to combine two layers together using one of five modes: crossfade, color only, tint, darken, and lighten. Blend can provide an alternative to using the cross-dissolve transition or layer modes to combine images. Used as a cross-dissolve, Blend achieves a slightly different look, especially in the way luminance values mix at the midpoint of the transition. Because transfer modes (covered in Chapter 13) can't be animated, the Blend effect also offers a way to animate the relative blending values over time.

When using the Blend effect, be mindful of the limitations imposed by all compound effects. If the effect source layer needs to be pretreated, use a nested composition. (See "Using Compound Effects," in Chapter 10.)

**To use the Blend effect:**

1. Place the two layers to be blended together in the same composition.  
One layer will contain the Blend effect, the other layer will serve as the effect source.
2. In the Time Layout window, click the eye icon for the effect source layer, to turn off its visibility (Figure 11.29).

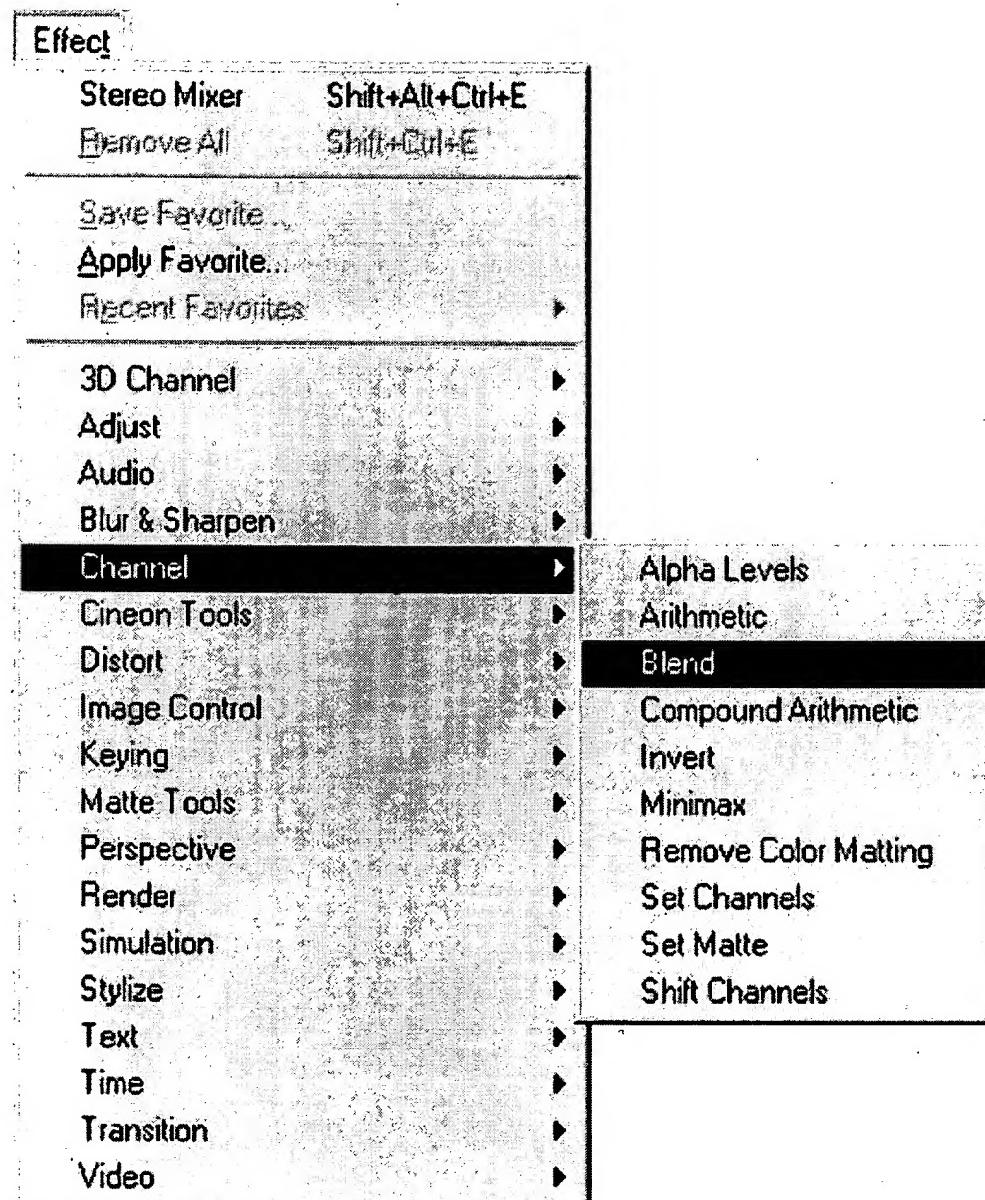
**Figure 11.29. Arrange a target layer and an effect source (or blend layer) in a composition. Switch off the video for the blend layer.**



The eye icon disappears, and the layer's visibility is turned off.

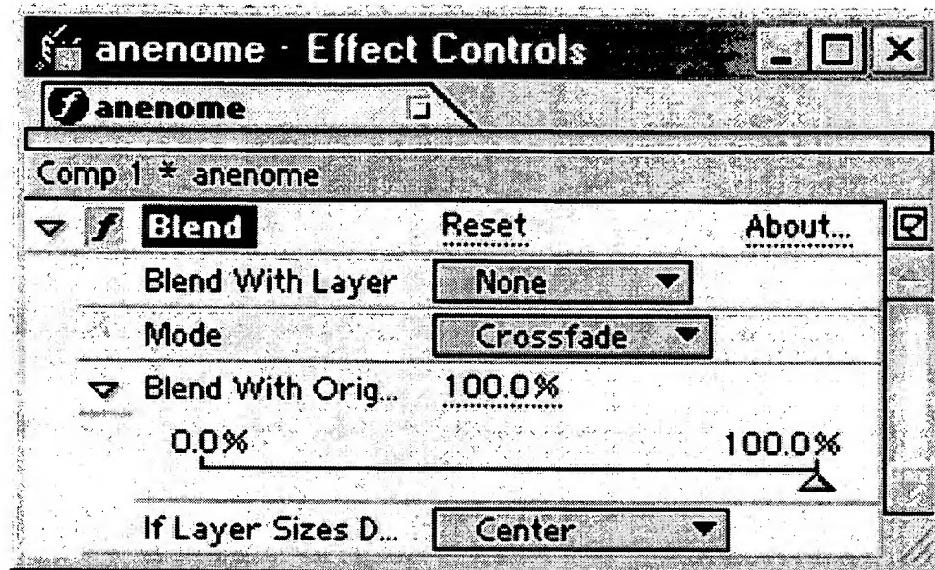
3. Select the layer you want to blend and choose Effect > Channel > Blend (Figure 11.30).

**Figure 11.30. Choose Effect > Channel > Blend.**



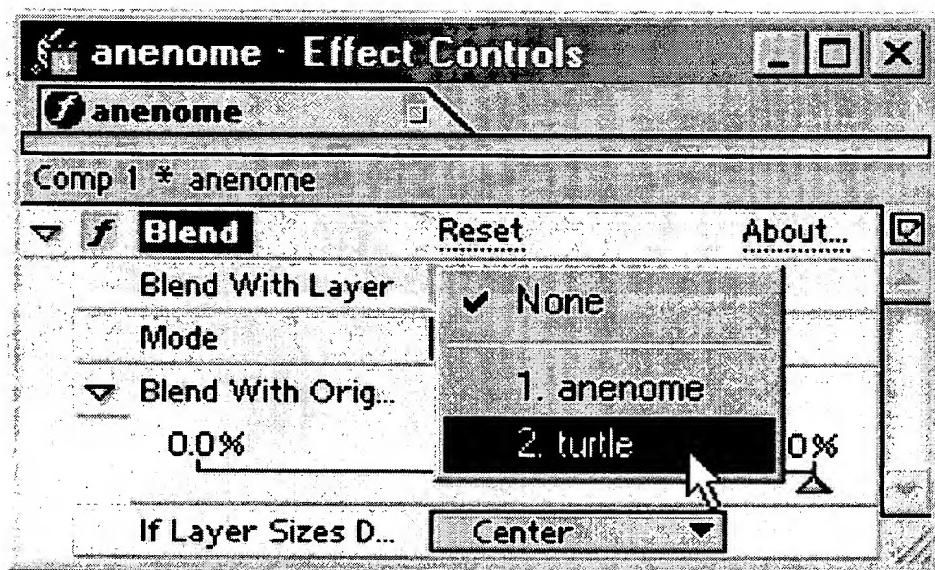
The layer's Blend effect appears selected in the Effect Controls window (Figure 11.31).

**Figure 11.31. The layer's Blend effect appears selected in the Effect Controls window.**



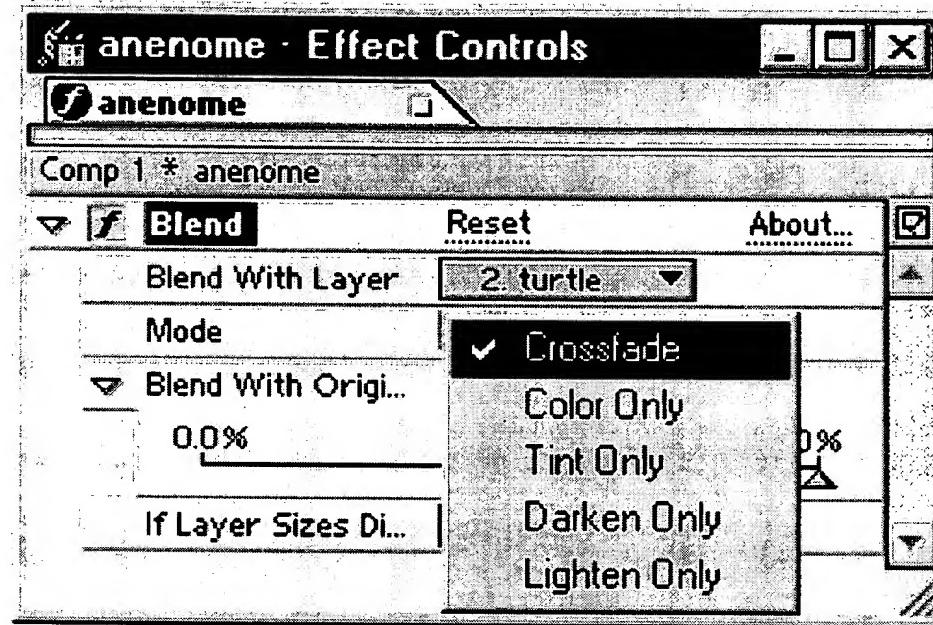
4. In the Effect Controls window, choose the effect source layer in the Blend With Layer pull-down menu (Figure 11.32).

**Figure 11.32. Choose the effect source layer in the Blend With Layer pull-down menu.**



5. Specify how the layer combines with the blend layer by choosing a blending method from the Mode pull-down menu (Figure 11.33):

**Figure 11.33. Choose a blending method from the Mode pull-down menu.**



**Crossfade** fades between the image and the blend layer.

**Color Only** colorizes the image according to the colors of corresponding pixels in the blend layer.

**Tint Only** tints only the colored pixels in the image, according to the colors in the blend layer.

**Darken Only** darkens pixels in the image that are lighter than the corresponding pixels in the blend layer.

**Lighten Only** lightens pixels in the image that are darker than the corresponding pixels in the blend layer.

6. Set a value for Blend with Original.

100% reveals only the layer containing the effect; 0% reveals only the effect source layer.

7. If necessary, choose an option from the If Layer Size Differs pull-down menu:

Center

Stretch to Fit

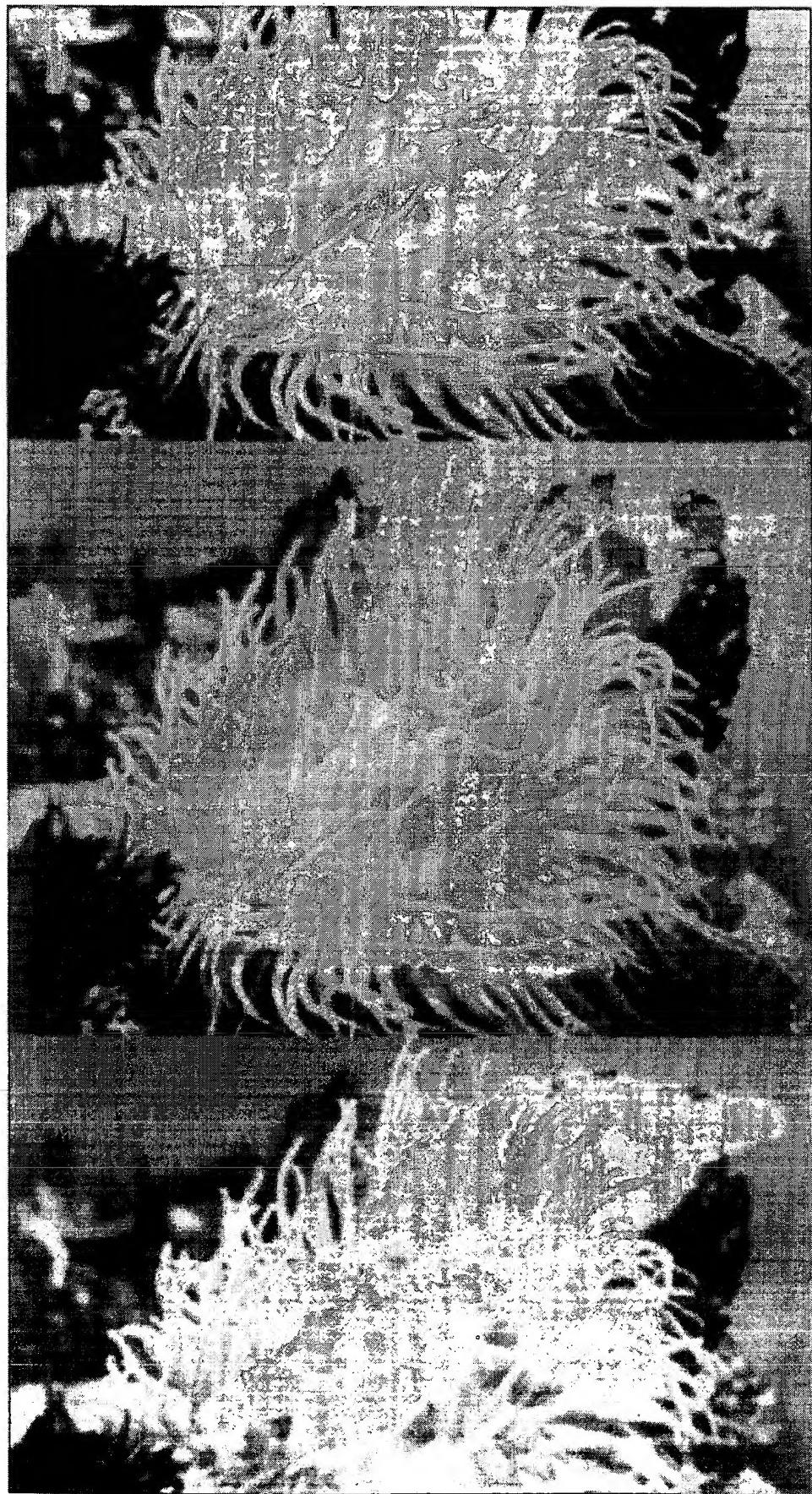
8. Animate the effect, using the techniques you learned in Chapter 7.

Animating the Blend effect can result in a variation of a cross-dissolve, or take advantage of the other mode options (Figure 11.34).

**Figure 11.34. Animating the blend effect can result in a variation of a cross-dissolve or take advantage of the other mode options.**







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## Chapter 12. More Layer Techniques

This chapter tackles a handful of techniques. First, you'll get to meet two layer switches that influence how After Effects deals with the motion between frames: Frame Blending and Motion Blur. Once you've taken care of the remaining switches in the Switches panel of the Time Layout window, you'll be ready to take a closer look at its alter ego, the Modes panel. In the Modes panel, you'll discover a long list of ways to blend a layer with the underlying layers, and expand your repertoire of compositing tools. You'll also find out what the mysterious "T" option really stands for, and more importantly, how to use it. Finally, you'll complete your tour of the Modes panel by learning yet another compositing option, Track Mattes.

### Frame Blending

When the frame rate of motion footage is lower than the composition's frame rate, movement within the frame can appear jerky. This can occur either because the footage's native frame rate is lower than that of the composition's, or because you time stretched the footage. Whatever the case, After Effects reconciles the difference in frame rates by repeating frames of the source footage. For example, each frame of a 15 fps movie is displayed twice in a composition with a frame rate of 30 fps. Because there are not enough unique frames to represent full motion, the result can sometimes look reminiscent of a flip-book animation.

In these instances, you can smooth the motion by activating the Frame Blending switch. When Frame Blending is on, After Effects interpolates between original frames, blending them, rather than simply repeating them (Figure 12.1 and Figure 12.2).

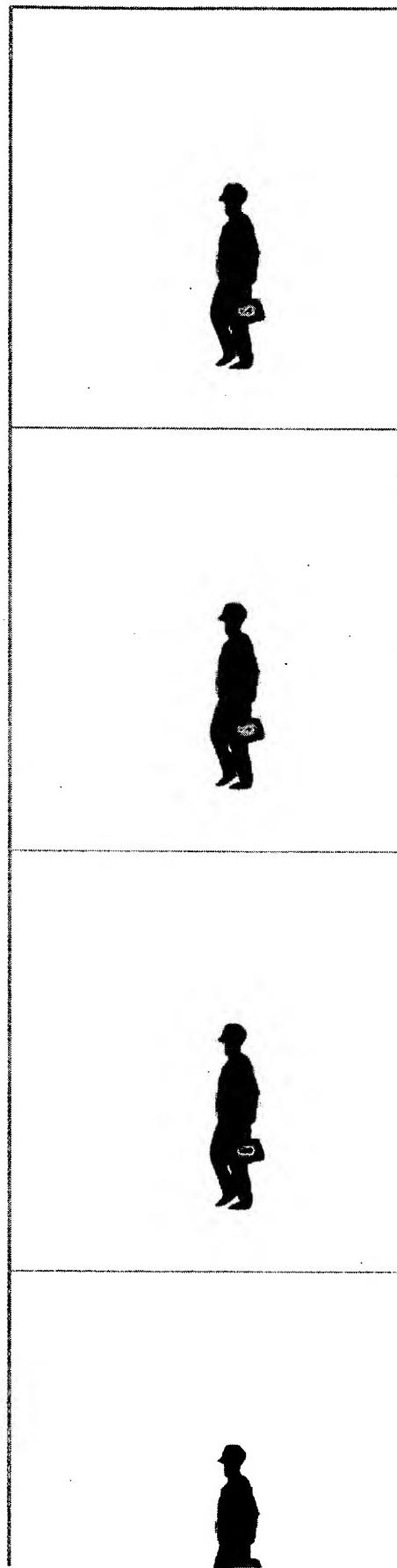
**Figure 12.1. Ordinarily, After Effects interpolates frames by simply repeating the original frames. This simple "walking cycle" animation has only ten frames per second (fps), so the first frame is simply repeated to compensate for a 30 fps composition.**



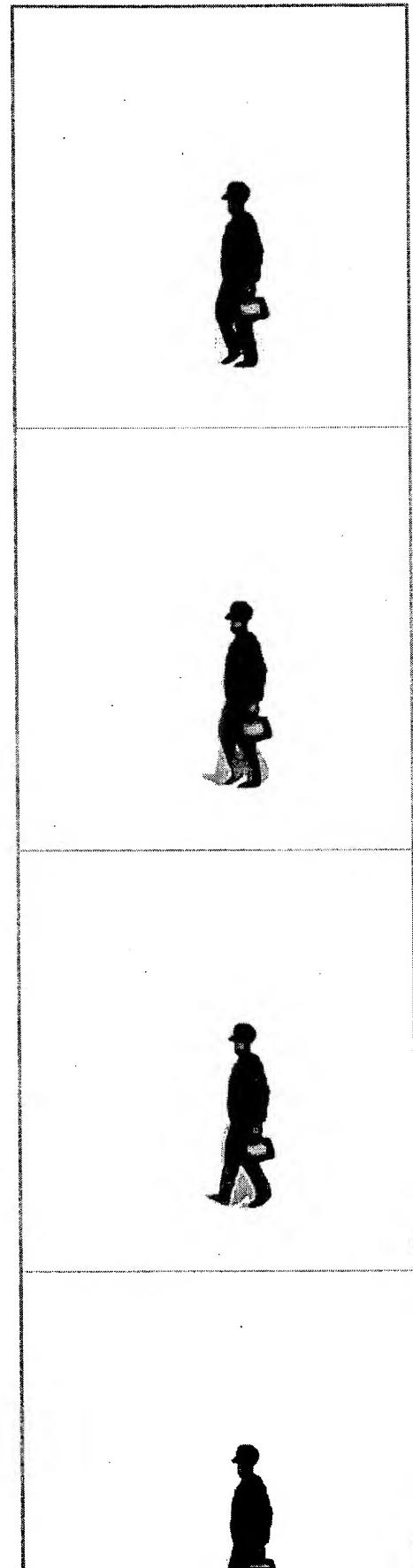








**Figure 12.2. When Frame Blending is applied and enabled, it blends the original frames to create interpolated frames.**

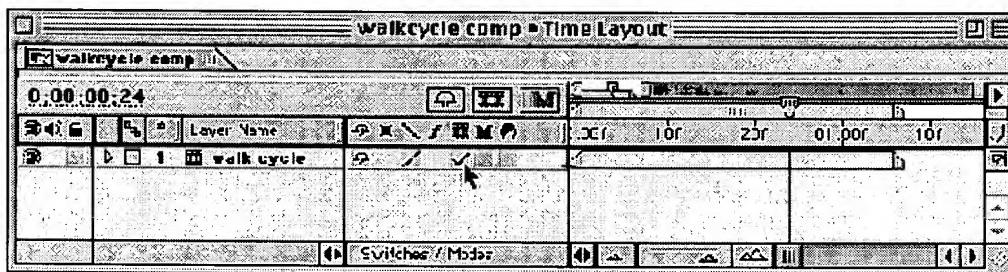


Because frame blending can significantly slow down previewing and rendering, you may want to apply it to layers without actually enabling it until you're ready to render the final animation.

#### To apply or remove frame blending in a layer:

1. If necessary, click the Switches/Modes button to make the layer switches appear.
2. Select the Frame Blending switch for a layer created from motion footage (Figure 12.3).

**Figure 12.3. Select the Frame Blending switch for a layer created from motion footage.**



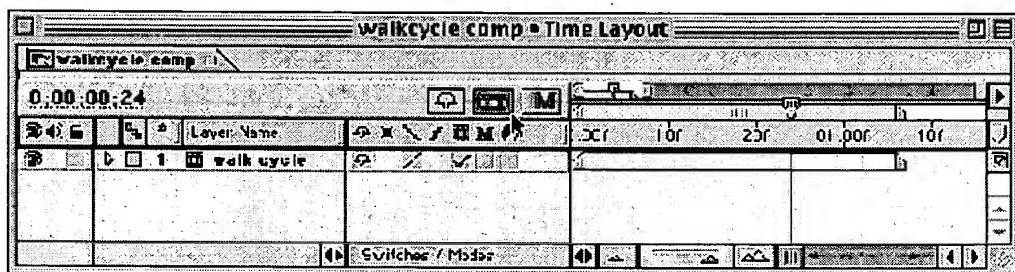
As long as the layer's frame rate is lower than the composition's frame rate, interpolated frames are blended together.

#### To enable or disable frame blending for all layers in a composition:

1. Do either of the following:

Click the Enable Frame Blending button at the top of the Time Layout window (Figure 12.4).

**Figure 12.4. Click the Enable Frame Blending button at the top of the Time Layout window.**



or

Select Enable Frame Blending in the Time Layout pull-down menu

When the Frame Blending button is selected or the Enable Frame Blending item is checked, frame blending is enabled for all layers with frame blending applied.

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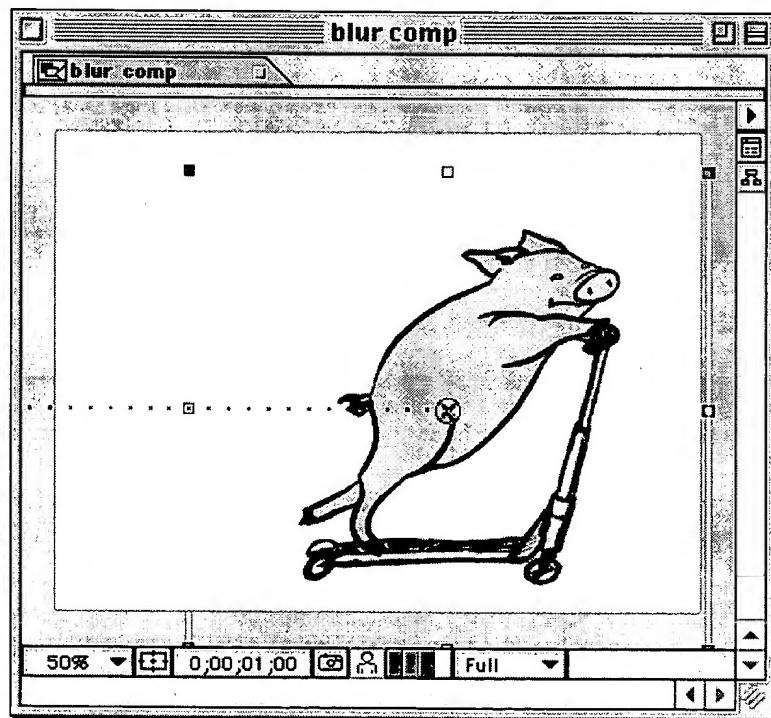
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### Motion Blur

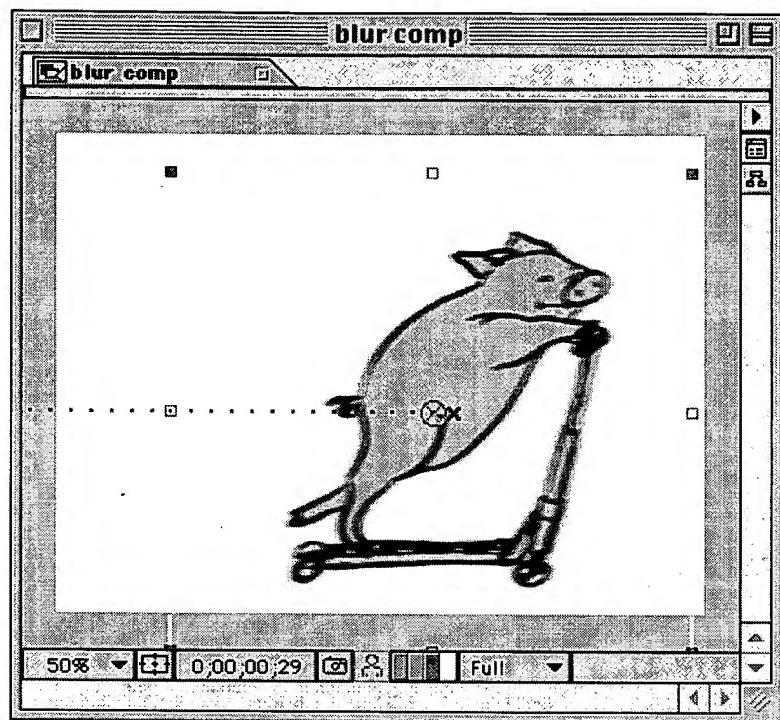
Ordinarily, an animated layer appears sharp and distinct as it moves through the frame of the composition (Figure 12.5). This can look unnatural, however, because we are accustomed to seeing objects blur as they move. Objects often move too quickly to be perceived at a single position by both cameras and the human eye. In the time it takes to perceive the object (or in the case of a camera, record it to a frame) at a single position, it has occupied a continuous range of positions, causing it to appear blurred.

**Figure 12.5. Ordinarily, an animated layer appears sharp and distinct as it moves through the frame of the composition.**



To simulate this effect, activate the Motion Blur switch for an animated layer (Figure 12.6). To reduce the time it takes to preview your animation, you may want to apply motion blur to layers, but leave it disabled until you're ready to render.

**Figure 12.6.** To simulate a more natural looking, blurred motion, activate the Motion Blur switch for an animated layer.

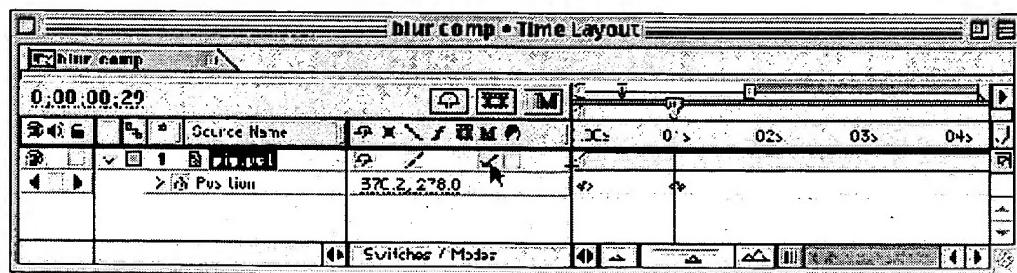


Because motion blur simulates the blur captured by a camera, it also uses similar controls. As with a film camera, a shutter angle control works together with the frame rate to simulate exposure time, and thus the amount of blur. For example, using a 180 degree shutter angle with a 30 fps composition simulates a 1/15th second exposure ( $180 \text{ degrees} = 50\% \times 360 \text{ degrees}$ ;  $50\% \times 30 \text{ fps} = 1/15\text{th sec}$ ). Increasing the shutter angle increases the amount of blur.

**To apply or remove motion blur:**

1. If necessary, click the Switches/Modes button to make the layer switches appear.
2. Select the Motion Blur switch for a layer with animated motion (Figure 12.7).

**Figure 12.7.** Select the Motion Blur switch for a layer with animated motion to apply motion blur.



When the Motion Blur switch is checked, motion blur is applied to the layer. The Motion Blur button

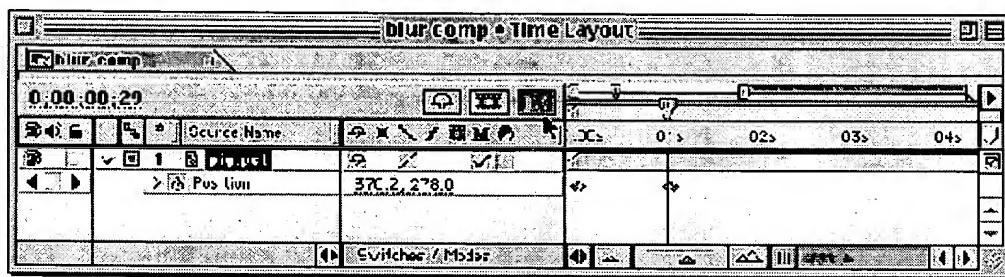
determines whether motion blur is enabled (see the next task for details.)

**To enable or disable motion blur for all layers in a composition:**

1. *Do either of the following:*

Click the Enable Motion Blur button at the top of the Time Layout window (Figure 12.8).

**Figure 12.8. Click the Enable Motion Blur button at the top of the Time Layout window to enable motion blur for the layers with motion blur applied to them.**



*or*

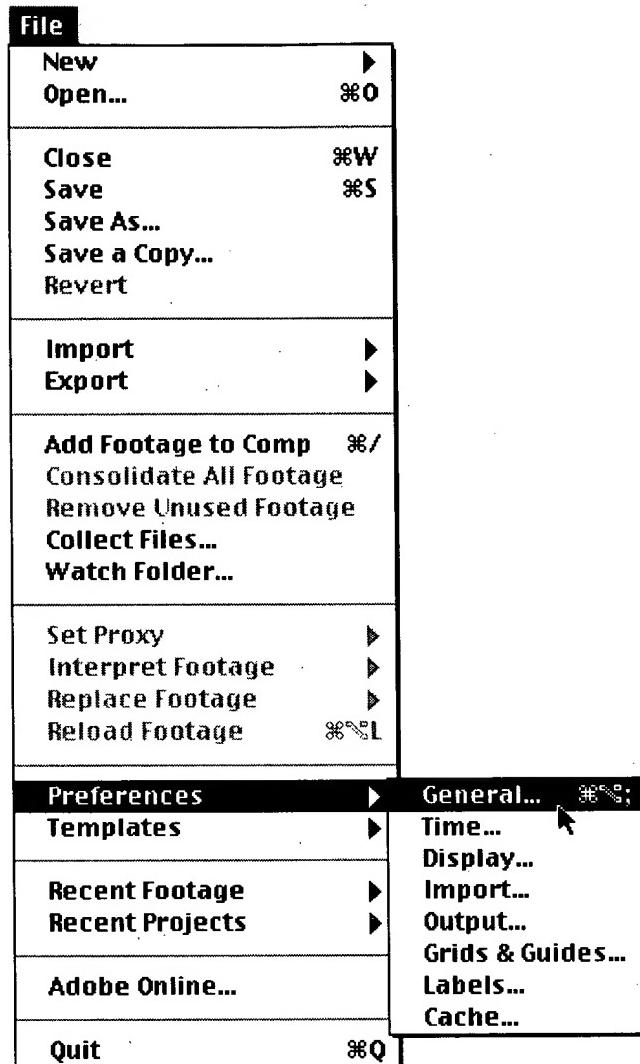
Select Enable Motion Blur in the Time Layout pull-down menu.

When the Motion Blur button is selected or the Enable Motion Blur item is checked, motion blur is enabled for all layers with motion blur applied.

**To set the shutter angle for motion blur for previews:**

1. Choose File > Preferences > General (Figure 12.9).

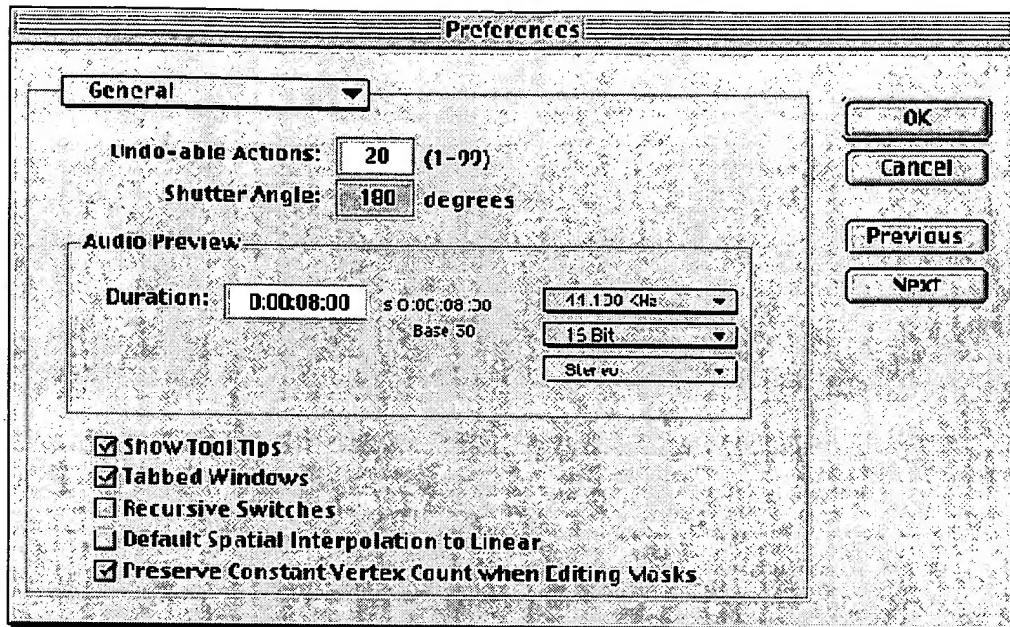
**Figure 12.9. Choose File > Preferences > General.**



The General panel of the Preferences dialog box appears.

2. In the Preferences dialog box, enter a value for the shutter angle, in degrees (Figure 12.10).

**Figure 12.10. In the Preferences dialog box, enter a value for the shutter angle, in degrees.**



You may enter a value between 0 and 360 degrees. The higher the value the greater the amount of blur. The value you set is applied to playback and preview.

Click OK to close the Preferences dialog box.

### Tip

When you render the final output, you can choose whether to enable motion blur and frame blending in the Render Queue window. This way, you do not have to go back to your composition to check the setting. See Chapter 16.

### Tip

The Render Queue window also allows you to reset the shutter angle for motion blur before you render a movie.

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